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Book Reviews

The Quarterly Journal of
THE BANGLADESH INSTITUTE OF DEVELOPMENT STUDIES

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Rural Savings and Investment in Developing Countries : Some Conceptual and Empirical Issues

by

MOHIUDDIN ALAMGIR*

I. INTRODUCTION

It is unfortunate that nothing much is known about the magnitude of rural savings and investment in most of the developing countries, neither one finds in the literature a satisfactory analysis of savings and investment behaviour of rural households.[1] Available data present somewhat different view of the rate of saving in rural areas of developing countries. Macro-economic national accounts data reveal a relatively smaller rate of saving by the rural sector, than cross-sectional survey data. For example, in the case of Bangladesh aggregate data produced an estimate for average rate of saving in rural areas of about 6 per cent in 1963/64[2]

*The author is a Senior Research Economist at the Bangladesh Institute of Development Studies, Dacca. This paper is an abridged version of a paper written while the author was a consultant to the Development Economics Department of the International Bank for Reconstruction and Development during December 1974-January 1975. At all stages the author benefited immensely from discussions with and comments from a number of individuals. Mr. Shankar Acharya and Mr. Suman Berry were constant sources of inspiration. Without their active help in many ways the paper could not possibly have been completed satisfactorily. Others whose comments were helpful to make substantive improvements in the presentation of the paper include Mr. Raj Krishna, Mr. Octay Yenal, Mr. Montek Ahluwalia, Mr. Suresh Tendulkar, Mr. Shahed Yusuf, Mr. David Wirmark, Mr. Lodewijk Berlage, Professors W. B. Reddaway and M. Anisur Rahman. The author is also grateful to Mr. Mark Leiserson, Mr. Albert Berry, Mr. Swadesh Bose, Mr. S. K. Singh, Mr. Peter Hazel, Mr. Marcello Selowsky, Mr. Shahed Burki and Mr. Irshad Khan for helpful discussion at various stages of the study. Finally, thanks are due to the participants of a workshop at the World Bank and a seminar at the Harvard University Center for Population Studies whose comments were helpful in preparing the final draft of the paper. The author alone, however, is responsible for any remaining errors or inadequacies.

[1] In this paper the term 'rural household' will include all types of households e.g., farm, non-farm and landless labourer households, that are found in rural areas. However, the major emphasis of the analysis will center round farm-households alone.

[2] Figure refers to rural saving (gross) as a percentage of rural income.

[9,p. 72], while the corresponding figure from quarterly survey data was 12 per cent[3] [14, p. 186]. On a similar note, Panikar [105, pp. 64-85] has contested the thesis that the rural sector in India is a deficit sector and used data from budget studies to show that the rate of saving in rural India is much higher than what is usually assumed. The conflicting results obtained so far, can be largely attributed to (i) difference in coverage of data and (ii) difference in the concepts used to measure income, saving and investment.[4] There is thus need for clearly defining the domain of rural activities as well as certain measures on it.

This paper sets out to do the following. In Section II the problem is defined more clearly and the underlying issues related to rural savings and investment are brought to surface. This is designed to provide a background of the study and to put rural savings and investment in the proper context for further analysis. Conceptual issues related to the definition of income, saving and investment are discussed in Section III. Sources of ambiguities and confusion in defining these concepts in the context of rural areas of developing countries are pointed out. Section IV discusses the alternative analytic approaches to explain rural saving and investment behaviour. An attempt is made to specify a comprehensive set of determinants that are likely to affect rural saving and investment behaviour. The nature of the relationship is indicated and to the extent possible supporting evidence is presented from available empirical studies. The paper is concluded in Section V with some concluding remarks and a suggested guideline for future research.

II. PROBLEM DEFINED AND BACKGROUND OF THE STUDY

Role of Savings in an Economy

From the point of view of the society saving is necessary in order to create productive capacity which will (a) maintain the present level of total availability of goods and services, (b) maintain the present level of per capita availability of goods and services, and finally, (c) increase the per capita availability of goods and services; all, of course, with reference to a future time period. Therefore, no society

[3]Figure refers to rural private saving (gross) as a percentage of rural private income (gross).

[4]One of the sources of difference between time series national accounts and cross-section household survey estimate of savings is consumer durables. Usually in national account estimates consumer durables are not included in savings while in household survey they are. For more on this see Section III.

and no individual economic unit afford not to save unless it is prepared to face natural decay. Clearly, there is a critical minimum beyond which such decay is inevitable.

The relationship between saving and the production process is a very close one. In the rural areas of developing countries the two are often inseparable. The link between saving and the production process is established through provision of fixed capital, working capital and a fund for the purchase of current inputs and other resources (services of capital asset belonging to others). Firth [37, p. 19] provides an example of a primitive economy (Tikopia) where too these three functions of savings can be identified.

Saving as it relates to investment and income growth involves intertemporal choice. Therefore, saving behaviour should be analysed in the appropriate intertemporal framework. In the rural areas, saving, investment, production and consumption are parts of a continuous process. Therefore, a snapshot analysis, although one is often compelled to do so due to data limitations, may be rather misleading, unless one is aware of the dynamic implications.

Transferability and Transformability of Saving

Transferability of saving refers to the question, how far is it possible to (a) transfer saving in one form of asset into another, (b) transfer saving from one sector of the economy to another, and finally (c) transfer saving from one set of economic units to another within the same sector or outside it. Saving takes place in heterogenous forms not all of which are equally productive. Therefore, by suitably changing the structure of saving it is possible to improve the productive potential of the economy while ensuring a reasonable rate of return to the saver. For rural households of developing countries, the choice is rather limited. One important task of a rural development plan would be to expand the scope for savings reallocation i.e., make savings more transferable, so that possibility of income growth is increased.

Transformability on the other hand, is what relates saving to the growth process. Importance of saving lies in the fact that it helps maintain the existing productive capacity and also to improve upon it. Therefore, it is absolutely essential that the act of saving be related directly or indirectly to creation of productive capacity. Thus, the crucial question related to any particular form of saving is to what extent it is transformable into productive capacity. Consideration of productivity gave rise to the controversy over the treatment of cash holding, expenditure on luxury and 'status' constructions, acquisition of gold, silver and other precious metals etc. Some of these items are quite important in the portfolio of households in developing countries. It is quite important that we understand the

motivation behind holding of non-productive assets and policy measures need to be adopted to turn them into productive assets. By direct policy intervention individuals should be prevented from acquiring non-productive assets of non-transformable variety (e.g., luxury housing). Some of the other non-productive assets which are transformable into productive assets without much cost are not done so because of either institutional constraints or constraints imposed by security (insurance) and liquidity preference. Households' holding of cash and gold and jewelery fall into this category although there is some debate whether or not the entire amount of cash holding should be considered as non-productive. There is no hard data on the holding of cash by rural households in developing regions but whatever evidence is available indicate that it is substantial.[5] Similarly, it is estimated that the stock of gold hoarded by rural households in some countries, e.g., India, is very large although annual net acquisition is rather insignificant [16].

It is important to mention here that some of the misdirection of savings (into non-productive assets) as well as non-realisation of potential savings arise due to lack of complementary inputs which frustrate attempts of households to acquire physical assets. For example, farm-households may not be induced to undertake physical investment activities unless they are assured that seed, fertilizers, credit and other complementary inputs would be available so as to guarantee a reasonable rate of return on investment. This portion of actual saving and the non-realised potential saving can be called 'frustrated saving'. Although it is difficult to obtain an estimate, yet one can perhaps safely speculate, on the basis of what is known of the availability of complementary inputs in developing countries, that the amount of 'frustrated saving' would be considerable in the rural areas of these countries.[6]

Savings and Investment in Rural Areas—A New Perspective

It was earlier mentioned that different authors tend to come up with conflicting evidence on the propensity to save (average and marginal) in rural areas of the developing countires [9; 14; 54; 71; 83; 103; 105; 127]. The major difference

[5]Reportedly, a large amount of currency was dehoarded from rural areas at the time of currency conversion of Uganda and Nigeria [3]. Experience, however, varies from country to country. For example, it is reported that individual sector accounts for a small proportion of total cash holding in Tanzania, Ghana, Zambia and Tunisia [159].

[6]Habibullah [58, pp. 34-35] made an attempt to estimate potential savings in the rural areas of Bangladesh. In his definition of potential savings he included the amount spent on socio-religious ceremonies and the loss or damage caused to assets and properties by natural calamities.

was observed between macro estimates and micro estimates. However, even on the basis of macro estimates it is found that the contribution of rural sector in total savings vary considerably over countries. Estimates are available for slightly different periods for Bangladesh, Philippines and India. Rural sector in Bangladesh accounted for 47 per cent of total saving and 33 per cent of household sector saving during 1969/70[9]. In the Philippines during 1971 rural sector contributed 53 per cent to aggregate saving [148]. On the other hand, in India over the period 1950-63, rural households accounted for 27 per cent of total household saving [34].

The above, however, does not reflect truly the magnitude of surplus mobilized in rural areas of many developing countries during 1950's and 1960's when a systematic policy of transfer of resources out of the rural sector through price and exchange rate manipulation, various forms of taxation etc., was followed [51; 80]. While such a policy was successfully adopted in Japan to attain a high rate of growth in developing countries in general, this policy resulted in a stagnating agriculture and rural sector and a widening of the disparity between rural and urban income per capita [6; 143].

An alternative viewpoint has emerged recently which suggests that all rural activities should be studied and evaluated in relation to the problem of rural poverty. It is now widely recognised that a large proportion of the population residing in the developing world would fall below what is called a minimum subsistence or 'poverty' line [6; 62]. In this context the issue then is, how to generate surplus in rural areas and invest it into productive pursuits within rural areas so that income could rise, particularly for those below the poverty line and further savings could be mobilized.

It is true that, in developing countries, for most of the rural households, out of the directly receivable income there is little margin over immediate consumption needs to allow the households to have any saving. There is, however, a part of the total household income which is indirectly receivable in the form of acquisition of non-tradeable capital assets. This portion of the income by difinition constitutes also a part of saving and investment of farm households. What is important, the saving-investment decision is integrated into the production process and is also closely linked with allocation of resources, particularly own labour time. The simultaneous production-saving-investment activity originates from the use of own or family labour in the production of non-tradeable capital assets, e.g., land improvements, contour bunding, irrigation canals, farm buildings, storage sheds etc. Such activities are known to and undertaken by all types of farm households

in rural areas. These are usually lumped together in national accounts under what is called 'non-monetized' farm investment.[7]

A few remarks on the nature and characteristics of self-labour embodied production-saving-investment activities of farm households are in order. (i) Firstly, these are production activities in the sense that at the end of the process an output is produced which we prefer to call non-tradeable capital asset. They are usually non-tradeable because there is no market for them and they are primarily produced for self-use.[8] (ii) Secondly, non-monetized farm activities add to income of the household. The income generation can be understood in the conventional sense of creation of value added. The value added is of course represented by the price of labour used in these activities. Thus, as soon as such on-the-farm activities are undertaken by the household, they can be said to generate income when the asset is created. The imputed value of the self-employed labour in asset creating activities should be added to the other components of income in order to obtain measure of total income. (iii) Non-monetized farm activities of the type discussed here generally represent acts of saving since the income originating from it is not consumed at all but entirely saved. However, it may be mentioned that there is no clear consumption-saving choice available out of this portion of income. This choice is actually exercised by the farm household at an earlier stage when resource allocation decisions are made. Thus, decision regarding allocation of resources among alternative uses and the choice between consumption and saving are combined in one. (iv) The amount of saving generated through the use of own labour is simultaneously invested in income generating assets. The assets produced through the process described above, either help maintain productive capacity of the farm household or adds to it. Thus, the self-labour embodied investments give rise to a stream of income in the future which is either consumed or saved.[9] (v) Non-monetized farm investments are often use-specific and to a certain extent lumpy in character. Use-specificity arises partly from the nature of services that

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[7]It may be noted here that the simultaneity of saving investment (but not production) decisions partly survives into the monetized stage for all self-employed production units (and corporations). So when it comes to investigating savings behaviour of such units, investment determinants must be analysed in the same breath, irrespective of the degree of monetization. I am thankful to Shankar N. Acharya of the World Bank for pointing this out to me.

[8]This statement should be qualified for agricultural implements which are produced with self-employed labour and non-purchased inputs because such items do have a market and can be traded either for money or other goods and services.

[9]In the case of farm residential housing, however, the self-labour generated asset directly produces a consumption stream which entirely absorbs the anticipated income flow.

originate from it. Land reclamation, bunding, irrigation ditches etc., usually have a minimum level beyond which its contribution to the production process is nil or negligible.

The magnitude of non-monetized farm investment a characteristic feature of rural areas in the developing world, is not very significant in many cases. Available data do not permit inter-country comparisons. Evidence from Bangladesh indicate that as a proportion of total rural household sector saving, non-monetized physical asset acquisition by the farm households comes to about 26 per cent and as a proportion of total national saving to about 7 per cent [9, pp. 379-81; 10].[10] However, it will be misleading to judge the importance of this component of saving only by its magnitude, given the fact that from the point of view of individual farm households it is indeed a major element in the decision making process.

It should be noted that the traditional dichotomy between saver and investor is to a large extent irrelevant in the context of rural areas in developing countries. In the case of farm households saving and investment decisions are taken by the same economic unit. This is not to ignore the role of rural capital market altogether, but in terms of providing link between two groups-savers and investors—its importance is only marginal.

III. CONCEPTS, DEFINITIONS AND MEASUREMENT : ISSUES AND DEBATES IN THE CONTEXT OF RURAL AREAS

Income

In general, rural household income is the sum of the net flow of receipts from different sources (types of economic activities) during an accounting period. Thus, income is a net concept in the sense that from the gross receipts we have to deduct all expenses incurred during the production process in order to obtain a measure of income. The current expenses of production, however, do not include depreciation allowance attributable to the fixed farm assets but do include cost of repairs and maintenance. Therefore, from a different point of view farm income can be looked at as gross or net income depending on whether depreciation is included or not.

In various studies on rural income and saving, gross receipts of farm household have been shown to include somewhat different items which represent certain amount of confusion still prevailing in the minds of researchers [133]. Gross receipts

[10]All concepts used here are gross of depreciation.

of a farm household should include receipts from, (i) farming—value of agricultural produce on own account (share/rent and interest paid should be deducted), (ii) forestry, fishery, livestock, poultry, sericulture etc., (iii) property-rental receipts in both cash and kind from hiring out land, and other farm assets e.g., agricultural implements and machinery, interest, dividends etc., (iv) business, crafts and profession, (v) housing, (vi) salaries and wages, (vii) transport equipment, (viii) miscellaneous sources—items which are not covered above, e.g., regular remittances (net) from outside, pensions etc., and finally (ix) use of family labour in the construction of non-tradeable physical assets (excluding those representing replacement of items damaged or destroyed by cyclone, flood etc. and/or current repairs and maintenance).[11]

The major confusion seems to be whether borrowings, drawing down of past savings, sale of assets, and net current transfers should be included in gross receipts of farm households or not. Strictly speaking the first three items represent increase in liability and dissaving on the part of the farm households and as such do not constitute a part of income. In the literature, there seems to be three views on the treatment of these items. Household income and expenditure surveys, in general, include them in the income concept [49; 90]. NCAER study on rural savings exclude all of the dissaving and transfer items from the income stream[94, pp. 68-71]. Bergan suggests that remittances received regularly should be included in the income concept, and other dissaving and transfer items should be excluded [14,p.56]. He is of the view that gifts and charities received occasionally do not represent proper transfers and therefore, has no place in the income concept. The method adopted in this paper is similar to Bergan's. However, if one is interested in drawing up a detailed balance sheet for sources and uses of funds, such receipts will be shown under sources.

Again, most of the studies do not include the imputed value of family labour engaged in the construction of non-tradeable physical assets. One notable exception is all India Rural Household Saving Survey by NCAER. In fact in both micro and macro studies, the omission of this item has resulted in a systematic underestimation of income. It is interesting to note that while in the estimates of national income in most of the developing countries, imputed value of family labour of the type mentioned above is not included, an attempt is made to include this in capital formation thus resulting in an asymmetry in the estimation procedure. On the balancing of the income and expenditure account this difference gets absorbed in residual item (usually private consumption expenditure) or is lumped under errors and omissions.

[11]For a detailed itemised account of the sources of income of farm households see, [94].

Receipts from farming is supposed to include the value of fodder crops, both products and by-products. However, this is often ignored on the assumption that it will cancel out with the current expenses for livestock where it is not deducted from gross receipts to arrive at family income. Such a procedure is quite common in national income accounting [50]. But it warrants a new approach and for family households these items should be separately enumerated to assess their individual position. The same is true of animal waste. Income from livestock and poultry covers value of net births and value of livestock and poultry products. All India Rural Household Saving Survey of NCAER which is otherwise quite comprehensive seems to exclude receipts from sale of meat and own consumption of other animal products [95, p. 17].

The current or operating expenses of rural households refer to expenses related to the production of all types of goods and services within an accounting period. It will, therefore, include rent for land, business premises and other types of hired asset, wages (in cash and kind) for permanent and casual labourers (excluding labour used for asset creation), cost of materials used (home-produced and purchased seeds, manures and chemical fertilizers, pesticides, water charges etc. excluding materials used for asset creation), cost of animal feed and other current expenses for maintaining livestock, other operating expenses and costs (other than own labour) of repair and maintenance of farm assets. Therefore, from the household expense account two things are clearly left out, own labour input and purchased labour and materials used in physical asset creation.

The difference between gross receipts and current expenses gives the gross income of farm households. This is actually the sum of the return to family labour in production activities and payment for services rendered to others by family labour and other assets. It is quite possible that in certain activities the gross income is negative, that is gross current expenses exceed gross receipts. Income accruing to farm households from the production activities is rather different from the concept of value added used in national income accounting. This is because while drawing up the household account, labour cost (purchased) is deducted while in national income accounting this is part of value added originating from the production activity under consideration. In point of fact, if defined consistently, it is quite possible to reconcile household income obtained from survey data with the national account concepts and measurement.[12]

A few cautionery notes[13] may be added here. The distinction between new construction and repairs and maintenance is very difficult, both conceptually

[12] An attempt was made along this line by Bergan for Pakistan with one year data. See, [14, pp. 58-61].

[13] I am grateful to Prof. W. B. Reddaway for pointing out these to me,

and statistically. In an extreme case, it may be desirable to ommit the digging of a new channel to "replace" an old one in a different place or the planting of trees to "balance" the cutting of old ones. Furthermore, division of the use of labour and material inputs between current production and non-monetized investment may be quite involved and in certain cases empirically intractable. Therefore, one may consider putting a value on the actual improvement and addition to assets, in calculating gross receipts and then say that one finds the farmers income by subtracting all material inputs and hired labour, whether they go into current production or non-monetized investment. However, as one moves beyond income and attempts to estimate saving and investment of rural households this procedure will prove inadequate.

Saving

Saving of an economic unit can be defined as the excess of current income over current consumption expenditure. This method of estimating saving is equivalent to an estimate of earned surplus. It uses flow concepts alone and in general holds true irrespective of the nature of the unit under study, country, region, household or business firm. One should, however, be cautious in applying this definition to a rural household or rural area as a whole.

In rural areas, the definition of income and consumption expenditure is not always unambiguous. Much care is needed to estimate income and expenditure so that the resulting estimate of saving be a meaningful entity. For an individual household saving is reflected in own account capital formation, lending and capital transfers to other individuals and sectors, current consumption or capital use.

Current income will include gross income as defined above and also gifts and assistance (net) irregularly received which were left out of the gross income concept. The previous section highlighted some of the difficulties involved in estimating gross income (household or regional) in developing countries. Consumption expenditure includes taxes.

Household survey data on income and consumption expenditure can be used to estimate saving of the rural households. Such attempts were made in a number of countries [16 ; 49; 71]. Problems with this method of estimating saving in developing countries are twofold. Firstly, there is systematic underestimation of income and overestimation of expenditure by households and there is no way of cross checking these estimates. Secondly, the method produces a total saving figure without indicating the use or the nature of assets acquired.

There are two problems in defining the domain of consumption expenditure of rural households. The first is the general problem of the treatment of consumer

durables and this will be discussed separately later in this section. The second relates to the question, how meaningful is the dichotomy between consumption and investment in a situation when consumption may increase productive capacity as much or more than physical investment. This is particularly relevant for rural households at or below subsistence level in developing countries. One could possibly adopt a human capital approach and distinguish between productive consumption and non-productive consumption. But this will not be very easy. A rather crude approach would be to treat any increase in the consumption expenditure up to the point which defines 'nutritional minimum consumption' standard, as saving. However, one can not minimize the problem of defining the concept 'nutritional minimum consumption' and that of obtaining reliable data on previous period's consumption.

An alternative approach, called capital account or balance sheet method can be applied to estimate saving of an economic unit. This is equivalent to estimating saving as the change in earned net worth during a period. While the earned surplus is estimated from the current account, the change in net worth is estimated from its balance sheet. In estimating the change in net worth all capital gains and losses are excluded. This is done so as to be consistent with the measure of saving derived from the income account, where the definition of income does not usually include capital gains.[14] From the balance sheet, saving is measured as changes in physical assets (acquisition minus liquidation and destruction caused by cyclone, floods, use up, fire, river action etc.) plus changes in financial assets (increases minus decreases) less changes in financial liabilities (increase in borrowings minus increase in lendings) less net inflow of capital transfers (inflow minus outflow) less net capital gains (gains minus losses).

A direct estimate of rural household savings by types of assets and groups of savers can be obtained through household survey which collects data for a reference period on individual households' net acquisition of financial and physical assets along with information on net capital transfers and net capital gains. The basis for data collection is usually the expenditure incurred on various items during the reference period. Such a survey could be approached from a broad or a narrow point of view. In the broader approach attempt will be made to collect data in a comprehensive way so that both current account and asset account methods could be applied to estimate household savings. Except for minor errors and omissions the two estimates should correspond closely provided, "(i) both

[14]This is, however, not a serious problem in the rural areas where transactions in asset are not very important. A more important item is capital destruction due to natural factors. See, [68, pp. 14; 93, p. 8].

exclude all valuation changes in an identical manner; (ii) both make the same distinction between current (non-capitalizable) expenditures which do not appear in the balance sheet and capital expenditures which do; and (iii) both follow the same method of adjustment for accruals and transfer items" [96, p.4]. No study, to the best of our knowledge, has so far tried to incorporate both methods mentioned above. All India Rural Credit Survey [117] collected detailed data on capital expenditure, capital formation and savings but in the case of income and family expenditure it covered only selected items. All India Rural Household Saving Survey by NCAER provides data only on income, savings and investment of rural households "although some useful information on unusually large items of consumption during the reference period was also canvassed through the schedule" [93, p.10]. Habibullah's [58] study on East Pakistan collected information only on the income and asset acquisition by rural households.

From survey data saving of rural household will be given by the actual net increase in physical and financial assets of the household during a reference period, after allowing for capital transfers (capital gains and losses are ignored here). Physical assets will include the follwoing items :

(i) Land—Net i.e., total purchases minus sales.

(ii) Livestock—Total births, purchases and gifts received minus total of deaths, sales and gifts given.

(iii) Land improvement and irrigation—Total expenditure (actual and imputed) due to reclamation of land, bunding and other land improvements, digging of wells, development of other irrigation resources and laying of new orchards and plantations minus sale of irrigation sources.

(iv) Farm equipments and machinery and transport equipment—Net acquisition.

(v) Farm houses, (including residential construction), cattle sheds etc.—Net acquisition.

(vi) Net acquisition of non-farm business assets.

(vii) Change in inventories (both farm and business)—increase in stocks less decrease in stocks.

Financial assets will include the following items :

(i) Change in currency holding.

(ii) Change in bank deposits (including postal savings deposits).

(iii) Contribution to provident funds.

(iv) Premiums paid to life insurance.

(v) Net purchase of small savings certificates.

(vi) Net purchase of bonds, shares, securities etc.

(vii) Net purchase of gold and silver.

The difference between change in borrowings and change in lendings gives the change in financial liabilities of rural households. Borrowing from both institutional and non-institutional (unorganised markets) sources are included here. It is expected that for rural households the latter will be more important of the two. Net capital transfer is measured as the excess of inflow of physical and financial assets into a rural household over outflow of such assets.

Finally, if saving in physical assets is estimated by taking the difference between the beginning and closing stock of assets, there is no need to estimate separately the damage and destruction of such assets during the reference period due to natural and accidental factors. On the other hand, to the extent that some of the components of saving are estimated from data on net acquisition due allowance must be made for capital damage and hence separate estimate of this will be needed. Now, a portion of the total capital expenditure that represents expenditure on items of capital stock destroyed or damaged during the reference period should be deducted from physical asset acquisition while arriving at saving estimate. The amount of destroyed and damaged capital which is not replaced should be estimated carefully through the survey questionnaire as for other items of physical asset acquisition and the basis of valuation for the two should be the same.

The above accounting procedure to estimate savings holds true for individual rural household. Some qualifications are necessary if one were to estimate aggregate rural savings or national savings. From the point of view of the rural area as a whole, purchase of land can not be considered as a saving except perhaps when there is net transfer of land from other areas to rural areas because purchases and sales within rural areas will cancel out. For livestock, similarly, there will be saving for the community only if a net addition to the livestock population takes place.[15] In the case of gold and silver, net saving will take place for the community when there is net absorption (production plus import minus export). From individual household's point of view premiums paid to life insurance represent a form of saving but while estimating the contribution of the household sector to national or regional saving, account has to be taken of the current expenditures involved in the life insurance business and dividends earned by the insurance fund.

[15]For a detailed discussion of these items, see, [117].

While estimating rural household's saving through the balance sheet method, one should record cash expenditures incurred under different heads and also the use of family owned labour and resources in the construction of physical assets. This part is often omitted in some studies [117]. But clearly, such omission from the point of view of rural households in developing areas is very serious. Although as a proportion of total national savings or gross national product the importance of this portion of the capital formation is rather moderate, yet it is of crucial importance for rural households. Some of these activities appear as integral part of the production process and as such can not be avoided. In many cases, if such activities are not undertaken production may be adversely affected.

Investment (Capital Formation)

Investment by an economic unit are of two types, physical and financial. However, attention is paid in this section on capital formation or physical investment alone. In this sense investment implies addition to capital stock depending on whether depreciation is included or not. Whatever may be the concept used, physical investment implies addition to capital asset alone, i.e., assets that give rise to a flow of output and income after a lag of time. The time lag between asset acquisition and increase in income varies according to types of capital equipment. Although financial asset acquisition, represents one form of investment by an economic unit, it does not qualify as capital formation or investment in the economic sense if we look at it from the point of view of the entire economy because it does not create productive capacity directly.

Real asset acquisition or investment can be estimated either directly from the asset account of the various economic units (expenditure approach) or indirectly, by using the commodity flow approach. The commodity flow approach uses the total availability data and produces an estimate of investment only by types of assets and not by groups of economic units. For studying the investment behaviour of rural households this method, therefore, appears to be rather inadequate although an aggregative analysis of rural savings can still be carried out.[16] On the other hand, the expenditure approach, in which data on new physical asset acquisition either for replacement or as net addition to the existing capital stock are recorded, is more useful in the context of rural areas because it provides information by both types of assets and groups of economic units and also because it can cover items of capital investment for which there is no market as such.

Following the expenditure method, "gross investment during the reference year is measured as a difference between acquisitions and additions to physical

[16]For a discussion on the special problems in using the commodity flow method in underdeveloped countries of Asia, see, [59,pp.116-24].

assets owned by the rural households through purchases, construction, improvement, gifts received etc., and liquidations and bequeathals of the assets to the other household"[95, p. 44]. For rural households in developing countries, the following are the important items included under investment or capital formation :

(i) Net purchases of land.
(ii) Net increase in livestocks.
(iii) Land improvement.
(iv) Farm tools and equipment.
(v) Means of irrigation.
(vi) Means of transport.
(vii) Farm structures.
(viii) Buildings and business premises.
(ix) Business machinery and other assets.
(x) Farm inventories and business inventories.

Unlike estimate of saving, net purchase of land will be considered only for rural areas as a whole, it will not be included in capital formation by the rural household, neither would it be considered as a part of national capital formation. However, one must, as in the case of estimating saving, make adjustments for capital damage.

There are many conceptual and empirical problems in estimating physical investment in rural areas of developing countries. To state a few, there are problems related to (i) poor record keeping by rural households, (ii) treatment of exchange and own labour, (iii) separation of consumption from investment expenditure, (iv) estimation of inventory accumulation, and (v) selection of reference period. These will be discussed briefly in turn.

Rural households in developing countries do not usually keep any record of their activities during the year. Even if some records are maintained in very crude form, they are unlikely to be very useful for undertaking the kind of asset acquisition analysis that we are interested here. Again given the level of literacy in rural areas of these countries we can not except any improvement within a short period of time. Furthermore, while it is relatively easy to keep track of monetary transactions the same is not true of non-monetary transactions. Formal income-expenditure account and balance sheet analysis of farm households for estimating their savings and investment is not feasible.[17] Basic data are mostly collected through

[17]There is one example in which data were collected from farm records. This was possible due to a Farm Record Keeping Project by the provincial Department of Agriculture and Forestry in Taiwan. For further reference on it see [103, p.3].

one shot survey where one has to rely entirely on the memory of the respondent for providing information. Therefore, data may be subject to wide margin of error. The problem is aggravated because capital expenditures by rural households are incurred in both kind and cash and they are often spread over the reference period in small instalments.

A related problem emerging from the above is the treatment of exchange labour. In the process of undertaking different economic activities, the farm household utilizes the services of own labour, hired labour and exchange labour. Since to farmers, unlike hired labour, exchange labour does not involve any payment, it may appear as free service and he may be tempted to omit it from his costing and thus provide a misleading picture of capital formation unless careful checks are made.

There are a wide range of problems associated with the treatment of own labour used in asset creating activities in rural areas. These problems can be lumped together under two headings; (i) measurement problems and (ii) valuation problems. Valuation problems will be taken up for discussion later. Measurement problems essentially involve assigning a portion of utilized self-employed labour time to the production of non-tradeable phsysical assets. This problem can also arise in the case of exchange labour but it seems that it gets more involved in the case of own labour. Working members of the household engage themselves in a number of activities in and around the house and in the field. Sometimes the work is only of a supervisory nature. It is quite conceivable that the respondent to the questionnaire will find it extremely difficult to report correctly the amount of own labour used in asset creating activities.

The problem of distinguishing between consumption and investment expenditure needs more careful consideration than what was given so far. In this controversy the more important items are expenditures on health, education and consumer durables. One extreme position is that all consumer expenditures in rural areas with poor living standards should be treated as investment expenditure since increased consumption raises productivity. We suggested earlier a compromise solution to this issue which implied that a part of consumption expenditure can be treated as productive consumption which will be reflected in the formation of human capital.

The consideration of human capital formation has gained prominence in the literature in the 1960's. In the context of rural areas, the relevant question is whether we can treat expenditure on health, education (formal and informal) etc. as capital formation. Health and education create problems because it is difficult to distinguish between consumption and investment component of the expenditure

on these items. We have not included either of these items in the savings and investment portfolio.

A more controversial item is the expenditure on consumer durables. In the literature, consumer durables have been treated as capital expenditure and hence as saving/investment, and also as current expenditure and hence consumption expenditure. The scope for this controversy exists because, on the one hand, like capital goods, consumer durable provide services beyond one accounting period, while on the other hand, they are not productive in the same way as all other capital goods, although one may disagree on this point. Four reasons are given for including consumer durables in investment and therefore, in saving [45]. (i) To maintain a tie-up between national saving and national wealth. (ii) In the context of a modern economy, certain consumer durables are essential to the functioning of the economy as producer durables. (iii) Estimates of saving including consumer durables provide a more satisfactory explanation of variations in saving than those excluding them. (iv) Motivations for buying consumer durables and saving are the same. In the context of analysing rural savings and investment behaviour, (i) and (ii) are not particularly relevant. In fact (ii) is not true for most of the developing world. Since in most of the areas under consideration expenditure on consumer durables is only a minor item there does not seem to be any *a priori* reason for (iii) to hold true. However, at this stage it is only an empirical question and should be verified with data from different regions. Finally, it appears there is some validity in (iv) above but that alone can not be a sufficient reason for treating expenditure on consumer durables as an investment expenditure. Basically, if one agrees with the notion that the definition and estimation of investment should centre round the concept of productivity, than a clear link between the two must be established before expenditure on consumer durables can be included in the estimates of saving and investment.

A different problem is raised with the estimation of inventory accumulation in rural areas. Rural households deal with a large number of heterogenous products which enter into production and consumption stream over the reference period. It is indeed very difficult for the respondent in any survey to come out with a reliable itemized estimate of change in stock of goods and materials in the possession of his household between the beginning and end of the reference period. However, inventory accumulation is an important problem for the developed economies, particularly for the corporate sector. In the rural areas of developing countries inventory expenditure is only a small portion of the total investment expenditure. Only in selected major items of consumption and production inputs the possibility of inventory accumulation exist and that again given the weak holding power of most of the rural households is not likely to be very significant.

Furthermore, it is a rather common experience that in agriculture, inventory changes are important only within a year and not from year to year.

Finally, the selection of the reference period may cause some problem. In rural areas, given the different crop seasons and different crop cycles for different households the estimation of inventory accumulation may vary considerably depending upon whether one use the calendar year, the fiscal year or the crop year as the reference period. The problem actually gets more compounded when accounts keeping households use different reference periods.

Monetized and Non-monetized Savings and Investment

Savings and investment can be either monetized or non-monetized depending on whether the activity is undertaken within a market framework or not. In the rural areas of developing countries, savings and investment appear in these two forms due to the fact that a part of the economy is characterised by the presence of what has been termed as "subsistence activities". The activities are "defined as the production of goods and services which are subsequently found to have been directly used by the producers or bartered but not exchanged for money".[18]

We can extend the domain of subsistence activities and include in it not only production activities but also savings and investment activities. However, in order to avoid confusion a more general term "non-monetized savings and investment" is used here. To be more precise, therefore, non-monetized savings and investment will refer to acquisition of such assets by the household which are directly used by it or perhaps partly bartered but not exchanged for money. Alternatively, monetized savings and investment represent those items in the savings-investment protfolio of the individual household which can either be directly used by it or exchanged for money. One important characteristic of this scheme of classification must not be overlooked here. This classification does not imply that there are different sets of items in the savings-investment portfolio of the individual households which could be separately marked as monetized and non-monetized. In point of fact this classification scheme cuts across all the different types of assets identified earlier while discussing the concepts of savings and investment. Therefore, any particular type of asset can constitute monetized or non-monetized form of savings and investment depending upon the nature of underlying transactions during the process of asset formation and acquisition. So, each type of savings and investment activity can be regarded as a continuous array representing

[18]A working group of the Economic Commission for Africa recommended the use of the term "subsistence activities" to refer to the non-monetary sector of the economy instead of using the terms "subsistence transactions" or "subsistence sector" which according to the group were somewhat misleading. See, [151, pp. 2 and 15].

various degree of monetization. However, for the purpose of analysis, it seems convenient that a cut off point be identified, on the one side of which we have monetized savings and investment and on the other side non-monetized savings and investment.

A number of important distinguishing features of the two types of savings and investment may be enumerated here. (i) Monetized saving includes acquisition of both physical and financial assets of all types mentioned earlier. On the other hand, non-monetized saving includes only physical asset acquisition, e.g., reclamation of land, contour bunding, digging of wells etc. (ii) Non-monetized saving and non-monetized investment are one and the same while items under monetized investment are a subset of those under monetized saving. (iii) Items under monetized savings and investment can be acquired through the market or can be created through the use of purchased inputs including labour and capital services. On the other hand, non-monetized savings and investment represent physical asset acquisition through the use of family labour and exchange labour with or without non-purchased inputs.

Problems of Valuation and Aggregation

Farm households' income, saving and investment consist of heterogenous elements which need to be valued and aggregated to obtain a total estimate. The general practice is to value the different items at market price or at cost as the case may be. The problems that arise in such exercises are similar to those faced in the computation of national income in developing countries. We shall discuss only a few major problems of valuation that arise in the use of sample survey data.

In estimating income, saving and investment in rural areas, one should try to obtain information from the households about the prices at which they marketed their products and services and also prices at which they obtained their purchases. The portion of the output and services put to own consumption and also the portion of owned input and services put to self-use in the production process should be evaluated at prices obtained above. Now, for those households which do not market their products and use only home produced inputs, a problem of choice of prices arise. Following the national income accounting practice, home consumed output should be evaluated at the average wholesale price at the farm site during the harvest months.[19] Commodities for which there are no specified

[19]Actually it is often suggested that the period should be the one immediately following harvest. On the one hand, not much transaction takes place while harvest is continuing, on the other hand, available information reveal that the major portion of the marketing of output takes place during, the period immediately following harvest. Therefore, the latter appear to be a natural choice as a basis for selection of price. It may be pointed out that in many cases price at farm site implies price at the primary market because no transaction may have taken place on the farm. However, after allowing for the transport cost the difference between the two is very negligible.

harvest months and those whose sale is spread evenly over the year, the average wholesale price for the year should be used. A similar procedure should be followed for home produced inputs.

A more serious problem arises with the treatment of labour. In the context of rural areas four groups of labour can be identified, e.g., hired casual labour, hired permanent labour, exchange labour and family labour. The first two types of labour receive payments in cash and kind while no such payments are made to the last two types of labour. Again, three types of labour use may be identified. These are related to (i) production activities, (ii) saving-investment activities and (iii) consumption activities. For a farm household these would imply contribution to, crop production (in land preparation, weeding, harvesting etc.), creation of physical assets (land improvement, digging of wells and irrigation channel etc.) and personal services (work around the farm house). For estimating rural household's income, saving and investment, these three types of use of labour must be carefully distinguished.

Cost of hired and exchange labour used in current production process form part of current expenditure and should be deducted from the value of output to obtain gross income of farm households. Hired labour (casual and permanent) should be valued at the payment actually made in cash and kind. Payments in kind should be evaluated on the same basis as the home consumption of output or on the basis of actual purchase price, if anything is obtained from the market. Exchange labour sould be evaluated at the average market wage prevailing during that season. Season may sometimes be undefinable, in which case a month may be used as a reasonable reference period. This is to isolate the effect of peak seasons none of which tend to last more than one month in most of the areas under consideration. Family labour employed in the production process are not usually included in the cost of production and therefore, in this instance the problem of imputing value does not arise.

Non-family labour employed in the creation of physical assets are to be evaluated on the same basis as mentioned above. For family labour, apparently three bases of evaluation exist, which include market wage, zero wage and minimum subsistence wage or average consumption wage. Zero wage is often advocated in the context of labour surplus rural areas of developing countries. Therefore, if the use of family labour would take place at a time when there is no alternative source of employment one would tend to agree with this view. On the other hand, the very fact that non-use of family labour in such asset creating activities would in turn affect production adversely, makes a strong case for assigning a positive price to such family labour. A simple basis would then be to use

the market wage rate. This would be somewhat artificial and also indefensible because in strict sense there really may not be a market for this type of labour. In that case it seems reasonable to fall back upon what is known as the 'minimum subsistence wage' or 'average consumption wage' as possible basis for evaluating family labour input. Average consumption reflects the actual cost incurred to sustain family labour through the period of asset creation while minimum subsistence reflects the minimum cost that will sustain family labour through the same period. Since 'average consumption' is more tractable concept than 'minimum subsistence', for our purpose the use of the former may be recommended.[20]

Now, to obtain total value of physical asset creation on the farm, one should add the value of other inputs used to the cost of labour. These inputs may be purchased and non-purchased. Purchased inputs should be valued at cost i.e., purchase price plus cost of transportation and any other incidental cost. Non-purchased inputs should be evaluated at the average market prices prevailing during the reference period. It is also necessary to estimate capital damage. This should be done on a replacement cost basis. In other words, the estimated damage should refer to the cost that would have to be incurred if the capital were to be restored to its original form. All components of the cost should be evaluated at the average market prices (retail for commodities) prevailing during the reference period.

Finally, a word should be said about inventory valuation. It has already been pointed out before that inventory accumulation is not an important item in the investment portfolio of rural households in developing countries. However, to the extent that it occurs one can simply value it at the average market price prevailing during the reference period.

Definition and Measurement of Repairs and Maintenance and Depreciation

Repairs and maintenance expenditure are incurred in order to enable the capital equipment to function properly in the production process. Thus, for a machine it will involve expenditure related to cleaning, oiling, adjusting and the replacement of short lived parts. To be more precise, such expenditure do not lengthen the normal life of the equipment.

Depreciation or capital consumption as an economic concept can be defined as a decline in the value of capital stock due to physical wear and tear,

[20]It should however, be pointed out that the above principle of valuing off-season family labour may produce an estimate of non-monetized investment higher than the cost of having the channel dug by a contractor with a machine. Besides "labour" valuation may also overstate the usefulness of the asset for production purposes. I am thankful to Prof. W.B. Reddaway for drawing my attention to these points.

obsolescence or accidental damage during the reference period. Alternatively, from a macro-economic point of view, it can be defined as that part of current capital formation which maintains the present productive capacity of the economy. Depreciation allowance accounts for the difference between gross and net saving and investment. Analytically gross investment is a useful concept in so far as it measures the amount of resources diverted from consumption to productive capital accumulation. Net investment on the other hand represents addition to the existing productive capacity of the economic unit.

Estimation of physical wear and tear of the capital stock is a difficult exercise in any country, more so in the rural areas of developing countries. While farm implements and machinery may have some built in decay factor, the same may not be true of physical investments like irrigation wells, canals, contour bunds etc. For these items, some minimum repair and maintenance seem to be adequate to keep them going. The specific problems in estimating depreciation in the rural areas are the following.

(i) There is no built in decay of some capital assets. Therefore, it is very difficult to assess the longivity of the asset. Some expenditures are undertaken every year on these assets which can be termed as repairs and maintenance. However in the process of repair and maintenance activity the asset may be improved upon, which unless very carefully acquired into can not be separated at all.

(ii) For most of the physical investments in rural areas obsolescence is not an important factor. Changes in production technology take place only in frequently and again all technical changes do not warrant a change in the character of all type of rural physical capital assets. Thus introduction of HYV and power tiller is quite consistent with unchanged forms of contour bunding and irrigation channels.

(iii) Because of heterogeneity of capital assets in rural areas, it is very difficult to group them into several categories and apply the same kind of life span and rate of depreciation. Again, both the life span and rate of depreciation may be affected by natural and environmental factors. However, if there is an abrupt change in the rate of physical wear and tear of capital asset due to natural calamity it can be recognized as capital damage.

(iv) Even if all of the problems mentioned above were solved, the basic problem of valuation would still remain there. Here perhaps the approach suggested previously in the case of valuation of capital assets, should be followed. However, the two additional questions remain. The first one relates to the issue of original cost base vs. replacement cost base. Since we are interested in the economic

concept of depreciaton, the latter method should be adopted for rural areas.[21] The second question relates to the determination of replacement cost where there may not be any market for the capital asset under consideration. Here the procedure suggested before can not be applied simply because the composition of labour input (i.e., proportion of hired, exchange and family labour) is an unknown entity.

(v) Finally, it may be pointed out that for many reasons the rural households do not really provide separately for a depreciation fund in the same way as a corporate business enterprise does. Given this fact it seems that the relevant concept for behavioural analysis is gross saving although for an analysis of growth potential estimation of net investment will have to be taken up.

IV. DETERMINANTS OF RURAL SAVINGS : MODELLING OF RURAL SAVINGS BEHAVIOUR

In modelling rural savings behaviour it is necessary to emphasize two aspects of it, the level and the structure. Discussion in the previous sections indicate that rural saving is influenced by a large number of economic, social, cultural and physical variables. Therefore, concentrating on saving-income relationship alone, following Keynesian and neo-Keynesian tradition, will be of very limited use. Available evidence does not permit any generalization about rural savings behaviour in terms of specifying a precise functional form and the variables to be included.[22]

Limitations imposed by availability of data rule out completely the possibility of estimating elaborate savings function either at the aggegative or disaggregative levels. Over and above data limitations, there are serious problems of estimation too. What seems to be feasible with the existing data is to choose one or few explanatory variables at a time to analyse their relationships with savings ; find out if the *a priori* hypotheses are accepted or not, or whether new hypotheses are advanced.[23] This is exactly what has so far been done in the literature on rural

[21]For a discussion of the various concepts of depreciation, see, [152,pp.15-17].

[22]For two recent surveys on savings function in developing countries, see, [81;140].

[23]As for a technique of analysis, apart from multivariate regression analysis, one can apply simple correlation or rank correlation method or linear probability model in order to analyse rural savings behaviour. Often considerable insight can be obtained by simply comparing averages over certain characteristics (while controlling for others) and applying statistical test of hypotheses on difference between averages. Regression analysis can be carried out with data for different groups and then Chow method can be applied to test for structural homogeneity.

savings. Only few variables have been identified and their effect on rural savings (aggregate and by groups) has been investigated into. Clearly, there is need for further work to genefate a larger body of data which could be used to estimate elaborate rural savings function. Such functions could then be integrated into a comphrehensive model of rural income, savings and investment.

Income and Rural Savings

The relationship between income and savings has received different treatment from different authors. Three differnt hypotheses are very well known, the absolute income hypothesis, the relative income hypothesis and the permanent income hypothesis and all of them have been tested against data on rural savings. In its simplest form, the Keynesian absolute income hypothesis has been tested by K.L. Gupta, [54] Ong, *et el.* [103]. Kelly and Williamson [71], S.L. Shah [135], H.K. Das Gupta and R.K. Dash [31], H.K. Pandey, Vishwa Nath and R.P. Singh [104], J.P. Bhati, T.V.Moorti. L.R. Singh and K.K. Verma [16] and Alamgir and Berlage [9].[24] Gupta's study is based on all India rural savings estimate(annual time series data) made by the Reserve Bank of India. He regressed per capita real savings on per capita real income[25] and obtained a marginal propensity to save of 3 per cent as opposed to 38 per cent in urban areas. Somewhat higher estimates were obtained by Alamgir and Berlage from time series data for Bangladesh (11 per cent), Ong, *et al.* from cross-section data for record-keeping farmers in Taiwan (between 35 per cent in 1969 and 69 per cent in 1966) and Kelly and Williamson for farmers in Jogjakarta area (11 per cent). In general it is established that absolute income is a significant determinant of rural savings. In all cases it is found that the marginal propensity to save is higher than the average. However, the degree to which variation in absolute income explains variation in savings seem to be different in various studies. It is interesting to note that except in Gupta and Alamgir and Berlage, the reported R^2 is quite low implying that absolute income is only one of many variables that influence rural savings in developing countries.

Only one attempt seem to have been made so far by Alamgir and Rahman to analyse the different components of rural savings [9, p.75]. However, this study is rather limited in the sense that it examines only the relationship between rural saving in non-monetized farm assets and agricultural income based on aggregate

[24]Although no functions were estimated, yet further evidence on the saving-income relationship in the rural areas of Bangladesh can be found in, Habibullah [58], and Asaduzzaman, M. [11].

[25]Rural Income series was estimated from Central Statistical Organizations' national income estimates. Income and Saving figures were reduced to real terms by applying GNP price deflator. See, [54, pp.578-79].

time series data. The result is significant but the proportion of variation explained in low (57 per cent).

We have come across only one study by K.K.S. Chauhan, S. Mundle and D. Jadhav which made an attempt to test the relative income[26] hypothesis in the context of rural areas [26]. The data are taken from a sample survey of 87 small farmers in Maharastra in India. Although the authors found evidence that tend to support the relative income hypothesis yet the limited data base does not permit any useful generalization.

K.L. Gupta [54] applies the permanent income hypothesis to the data on rural savings. He defined permanent income as the three year moving average of real per capita income. Coefficients of both permanent and transitory income were significant and the former was lower than the latter. He concludes, "While Friedman's hypothesis is again not supported in its strict form, the evidence is in the correct direction" [54,p. 581].[27]

It is often maintained that the saving behaviour of a community or individual household will be significantly influenced by the source of income [60; 83]. There are many studies which look into this question at the national level. In particular attention has been drawn to the differences in the marginal propensity to save out of wage income and non-wage income. In the context of rural areas the definition of wage income is not very clear. From an aggregative point of view, purely hired out wage variable is only a small component of the total income in rural areas with small year to year variation and therefore, its effect on total rural savings is likely to turn out to be insignificant. On the other hand, if one were to include in wage income the imputed value of family labour, then the sum of the two will probably dominate total income and this variable will pick up most of the variation in savings.

The sources of income issue can be handled in two ways. First, total household income can be divided into income from cultivating owned land and other income. This will be more applicable for studying the savings behaviour of the farm household groups in rural areas. Kelly and Williamson [71, pp. 392-93] applies this by running regressions for different cumulative proportions of income originating from owned land. It is found that the marginal and average savings ratio increases with the degree of land or asset ownership (using proportion of

[26]Relative income was defined as the ratio of net household income of the family to the arithmetic mean of net household income for the sample [26, p.46].

[27]This statement was made because no support was found for Friedman's hypothesis that marginal propensity to save is unity out of transitory income.

income originating from owned land as an index of control over productive assets). A second alternative would be to classify farm-households on the basis of the ratio of on-farm agricultural income to total farm-household income. Following this procedure Ong, *et al.* found that "APS's and MPS's are fairly consistent in showing better savings performance among high ratio households" [103, p.10].

Wealth and Rural Savings

Wealth or accumulated net worth of an economic unit do affect its saving behaviour and the same is likely to be applicable to rural households. It is usually expected that other things remaining the same, wealth or asset holdings will have a negative effect on saving-income ratio. Asset adjustment models [41] and a 'normal wealth' hypothesis [27] have been applied to analyse the effect of wealth on savings. In rural areas landholding has been found to have significant and positive influence on the savings of rural households. Kelly and Williamson [71] found that APS's and MPS's of Indonesian farmers tended to rise with greater land-ownership. A similar result was obtained by Asaduzzaman [11] and Ong, *et al.* [103]. Such findings are correctly attributed to a positive interaction between income and wealth. In India a number of studies by J.S. Sisodia [139], B.M. Desai [33], B. Misra and S.C. Mallick [84] and M.G. Ghosh [42],[28] found size of landholding to be an important factor causing variations in savings behaviour of farm households. It is also suggested that the higher average rate of savings by the large landholders is a reflection of availability of profitable farm investment opportunities, alternatively expectation of additional on-farm income. It may be added here that Ong, *et al.* [103] found that the difference between large and small farmers in marginal savings behaviour was not very significant.

In this context one should take note of the effect of working capital on income, saving and investment in rural areas of developing countries. Lack of working capital which reflects a week staying power of the farm households is likely to lead the household to get into debt at unfavourable terms and also to undertake distress selling of its products. Small farmers are likely to be more common victims of this phenomenon. Asaduzzaman's study reveal a negative correlation between proportion of consumption loan and size of landholding.

Land Tenure and Rural Savings

Land tenure system has important effect on the savings and investment behaviour. For example, in a situation where the tenant does not have any security of tenancy he will have little incentive to make improvement of land or of

[28]In his sample farms, Ghosh found that size of holding affected investment per acre in modern farms and not in traditional farms.

irrigation system. This may be partially offset if the landowner forces the tenant to undertake such investments (which implies contributing free tenant labour with or without material input towards land improvement etc.). Similarly the owner operator has a personal stake in his own land so that he will have the incentive to undertake non-monetized farm investment.[29] Besides, other conditions are also important in terms of their effect on rural savings and investment. Thus, both the terms of cost sharing and output sharing will affect the work incentive of the tenant. Therefore, the more equitable the cost sharing is between the tenant and the owner, and the more favourable the output sharing is to the tenant, the greater will be the incentive of the tenant to be more productive and undertake investment on the farm and also perhaps adopt new technology.

Only some limited information is available on the relationship between tenancy and capital formation. These studies are due to D. Jha and S.D. Salunke [68], K.K. Chauhan and N.L. Agarwal [25], and G. Ojha [100] for India and due to Sandoval [132] for the Philippines. One can also refer to the Kelly and Williamson [71] study which indicated a positive association between average and marginal propensity to save and the degree of landownership. The results of the Indian studies seem to confirm our expectations. In general, secure tenants and owners undertake relatively more long term investments (e.g., land reclamation, machinery, new technology etc.) than others. The Philippines' study revealed that the average farm household residual income (total cash receipts less farm operating expenses less family living expenditures) was highest for owner farms followed by in order, part-owners, lessees and share tenants.

External Resources and Rural Savings

In the literature there is considerable debate on the effect of external resource inflow on domestic savings [8]. However, no one seem to have studied separately the relationship between external resource inflow and rural savings. In this case, two opposing forces will operate on rural savings. First, external resources which finance import of agricultural input and machinery, will have a positive effect on agricultural production and therefore, on income and saving. Second, external-resource-financed import of major agricultural product, e.g., foodgrain, will tend to depress agricultural prices in general and price of the imported item in particular, thus adversely affecting rural households' income and saving. Similarly, industry oriented imports will have adverse effect on rural development

[29] In a large farm, however, the owner cultivator may be unable to exploit the potential of the land fully and he may not in some cases undertake any investment at all. This will, to some extent, be a function of the availability of family labour.

and saving. The relative strength of these two forces will vary from one country to another, from one region to another and finally, from one period to another. Everything actually depends upon the overall strategy of rural development. The saving depressing effect of agricultural imports can be neutralised either by a price support policy or by strengthening the rural savings mobilisation institutions. Similarly, in certain cases premature import of new technology may have adverse effect on employment, income and savings of some rural household groups and in the aggregate the effect on rural savings may be uncertain.

Rural Credit, Rural Institutions and Rural Savings

Rural Credit and rural institutions affect rural savings in many ways. Availability of credit is important for rural households in order to be able to finance current consumption expenditure or expenditure on durable and non-durable capital. In rural areas of developing countries availability of credit appears to be an important constraint on farm-households' production and investment activities. Therefore, the relationship between credit and saving-investment activities in rural areas is a very close one. Greater availability of credit will enable the farm-household to undertake larger productive expenditure which will increase its income and saving. Besides, an easy access to credit will provide incentive to the farm-household to increase its effort at generating savings on its own account. In this respect a linking up of credit with savings through rural financial institutions may be considered. In a recent tractor credit survey in Pakistan it was found that farm-households who obtained tractor credit made investments in buying fallow land and making improvements upon it. Desai [33] found that investment in non-durable capital and current borrowing of farm-households was very closely correlated.

In forging an effective link between credit and savings, institutions and interest rate policy play a very important role. The role of financial institutions in mobilising voluntary rural savings and allocating credit has been emphasized by Dale W. Adams [4] and also in a recent ESCAP/SIDA/ISBI Seminar in Bangkok on Mobilisation of Private Savings it came up for serious consideration.[30] Specialised institutions like land mortgage banks have been successful in influencing rural savings and investment in many areas [110; 112].

In analysing rural savings the role of interest rate is pivotal. It is often contended that an unrealistically low rate of interest in the organised rural sector on the one hand acts as a disincentive on rural saving and on the other hand it misallocates credit [4]. Therefore, a rationalisation of the interest rate structure is

[30]See various papers presented at the Bangkok seminar and also the final report of the seminar.

warranted in the rural areas of the developing countries. One available study [53] shows that interest rate yield on post office savings deposits and savings certificates has a positive influence on rural savings although this influence is not as significant as in the case of urban areas.

Governments in developing countries can play a very influencial role in affecting rural savings and investment. On the one hand, through public sector investment expenditure in agriculture it can induce farmers to save and invest on their own. This will essentially be effected through the creation of profitable investment opportunity for the rural households. On the other hand, through necessary regulations it can make financial institutions to extend their activities into rural areas, provide adequate fund for credit, make complementary inputs available on time and in sufficient quantity, and most of all provide extension services. It is expected that these will have positive influence on rural savings and investment.[31]

Taxation and Rural Savings

It is interesting to note that while considerable analysis has been done in the literature[32] on the relationship between taxation and savings, this has not been done in the case of rural areas. In general it can be stated that to the extent that rural taxation is an attempt to divert resources from the private sector to the public sector, the effect on total saving will depend partly on the marginal propensity to consume by the government and partly on the readjustment of the production-consumption-saving decisions by the private sector. If public saving entirely substitutes private saving, there will be no net effect on total savings. On the other hand, if public saving is less than the reduction in private saving then there will be a negative effect on savings. A positive effect on total saving will come about if tax payments and consequently public saving comes from a reduction of consumption and/or an increase in production and income. However, if income increases sufficiently both consumption and saving may go up.

The case of rural areas is no exception to what has just been said above. A tax on income or net worth of a rural family will affect its production, savings and investment decisions depending upon the availability of idle resources at its disposal, marginal rate of substitution between work and leisure of the working members, relative prices of the output produced on the farm etc. The net effect on total saving, obviously, is rather uncertain. It should be noted here, though,

[31]One instance of Government regulations adversely affecting rural savings and investment is the embargo on investment in extending rubber plantation in new land in Malaysia. See,[144].

[32]For some references see [81, pp. 15-17].

that the political power of the landed interest in most of the developing countries makes it very difficult for the ruling elite to use taxation on agriculture as an effective means of mobilising resources in the rural areas.

Demographic Characteristics and Rural Savings

An analytic framework which incorporated demographic characteristics in explaining consumption and saving behaviour of individual households was proposed first by Modigliani and Brumberg [85] and later by Modigliani and Ando [86]. This is known as the life-cycle hypothesis and it relates household age structure to its saving behaviour. The two corner stones of this hypothesis are, temporally constant per capita consumption and a strong retirement motive for saving. It is rightly pointed out by many that these assumptions may not hold true for developing countries and more so in rural areas where the institution of extended family system call for a modification of the life-cycle hypothesis. Empirically, this hypothesis is tested by introducing age of the head of household and the dependency ratio into the analytic framework used for explaining rural household savings behaviour. Testing of this hypothesis often present serious difficulties because it may not be possible to control for other socio-economic factors that also affect rural savings behaviour. Ong, *et al.* found that "there appeared to be little difference in savings performance between high and low dependency ratio households" [103, p.10]. The most searching analysis of this hypothesis was carried out by Kelly and Williamson [71, p. 392-99] with Indonesian data. They found evidence which partially support the life-cycles hypothesis in the context of rural Indonesia. However, they point out that the effect of education may have somewhat distorted results.[33]

Household size and dependency ratio are supposed to reflect the expenditure pull on household income. The usual expectation is that these variables would be negatively correlated with saving. Desai [33, p. 75] observes a weak negative correlation between household size and durable capital of rural households. As pointed out by Snyder [140, p. 151], attempt to introduce family size as an explanatory variable in the savings function is not likely to be useful because of high intercorrelation between income and household size as observed in developing countries. However, in the overall context of developing economies, the dependency ratio performed better than age of head of household as a determinant of

[33]D.B. Gupta studies the relationship between age of head of household and consumption (divided into major items) in rural and urban areas of U.P. and Madras in India. His findings were not conclusive in the sense that "The Influence of the age of the head on consumer behaviour was different for various items of consumption and in the four regions" [52, p. 715].

saving although reservations were also expressed about such finding.[34] This result can be extended to state that a high rate of population growth would tend to depress savings rates. However, this needs to be examined carefully before any definitive statement can be made. Effect of population growth on income and savings will depend on the man/resource ratio on the one hand, and the level of technology and the rate of technical progress on the other.

The Price Level and Rural Savings

The relationship between price level and savings has remained one of the more relatively difficult areas of study. Price level seem to affect savings through a number of variables whch may have positive and negative effect. There does not seem to be a clear theoretical basis to arrive at a unique conclusion. Studies of developing countries on this issue have been limited to national savings [158] and urban savings [35]. No study has yet been made for rural areas. To the extent that price effect works through valuation changes of monetary assets it is likely to be negligible in rural areas of developing countries. However, higher relative prices of agricultural product should have positive effect on output, income and savings in rural areas. On the other hand, an adverse set of relative prices would tend to reduce output, income and savings. Price expectations are likely to have similar effect. However, these results cannot be generalized since the behaviour of deficit farmers and landless labourers is likely to be different from that of surplus farmers. A price rise is likely to reduce their real income and this will reduce their capacity to save. This is particularly true of families whose major sources of earning is wage labour, since in rural areas wage price adjustment is not automatic. In fact rise in money wages tend to lag far behind rise in prices [6]. Therefore, for rural areas analysis of the relationship between price level and savings should be carried out separately for different groups.

Rural Market Structure and Rural Savings

Rural market structure affects rural savings through the degree of openness of the rural economy, access to inputs, marketability of output, and commercialisation of the rural economy. Openness of the rural economy can be measured by the share of goods and services originating in urban areas absorbed in rural areas to total absorption of goods and services in rural areas. The openness index as an explanatory variable should be looked upon differently for different groups of farmers. For small farmers it may provide consumption incentive

[34] N.H. Leff [78] found that dependency ratio had a significant negative effect on saving. He concludes that high birth rates leading to high dependency ratio are major causes of low saving rate in LDC's. K.L. Gupta [55] observed that this result can not be generalised for all developing countries.

which may lead to more hard work, more income and more saving. Chandravarkar maintains, "if one takes into account not only the negative "demonstration effect" but also the positive "incentive" or "inducement good" aspect of increased and diversified consumption, particularly of modern durables (e.g., radios, sewing machines, bicycles and clocks), it is arguable that the net impact of such consumption may well be to stimulate the propensities to save, work, invest, innovate and take risk" [22,pp. 40-41].[35] For large farmers openness implies availability of sophisticated consumer durables as well as, inputs and various types of capital goods. If Freedman's [39] findings for Taiwan[36] can be extended to other areas then it is reasonable to assume that the degree of openness of the rural economy is positively correlated with income and saving and this will be true of total rural savings too.

If the market for inputs operate in a manner such that a group of farmers have easy access and others do not, then it may have adverse effect on income and saving. This will be more so if the inputs are subsidised. Those who have easy access are likely to make inefficient use of these resources while for the other group it will act as a disincentive for undertaking any investment expenditure, particularly in new technology. A similar analysis can be applied to marketability of output; easy marketability, other things remaining the same, will induce the rural households to increase their marketed output. In this context, the role of the exploitative middlemen has a dampening effect on saving directly and indirectly, although in certain instances their role as the only link between individual households and the market can not be ignored. Related to the above is the factor, commercialisation of the rural economy, which is also likely to have important influence on rural saving. Commercialisation is usually measured by the extent of area under commercial crops. Evidence provided by Sisodia [139,p.55] and Desai [33,p.57] indicate a rather weak relationship between rural savings (physical assets) and extent of commercialisation.[37] Clearly, more research is necessary before anything further can be established.

Production Possibility, Technology and Rural Savings

In any given area production possibility and technology are reflected in the cropping pattern and intensity, profitable investment opportunity, level of technology, gestation period of various types of physical assets including on-farm

[35]For arguments along the same line, see also [101].

[36]The author studied the Taiwanese case and concluded that consumer durables are purchased out of increments to income and at the expense of non-durables, particularly food.

[37]Commercialisation of agriculture, by way of bringing the farmer in closer contact with the market introduces him to various forms of monetized savings and thereby is likely to produce inducement to raise saving.

investments, extent of adoption of HYV, provision for irrigation and drainage facilities, fertility of the soil, scope of land reclamation, means of communication, urbanization, degree of vulnerability to weather and natural calamities, and the status of the farmer.

If one examines the factors mentioned above very carefully, then it would be apparent that availability of profitable investment opportunity can be considered as a synthetic factor representing the effect of a number of other factors. Actually this is what introduces explicitly a dynamic element into the analysis of savings and investment behaviour in the rural areas of the developing countries. It is expected that the existence of profitable investment opportunities will induce rural households to save more. In other words, other things remaining the same, profitable investment opportunities will have a positive influence on rural household savings. Rajagopalan and Krishnamoorty studies the effect of investment opportunities on savings of farm households based on the data of "a sub-sample of 30 farms—drawn from farms selected for studying the problems of the introduction of hybrid corn and as such the samples who planted the corn should have high degree of awareness and adoption of improved technology" [114, p. 113]. The authors used input-output ratio as an index of investment opportunity. In two equations, they regressed saving per capita/per acre on income per capita/per acre and input-output ratio. The results were significant, although for the coefficient of input-output ratio in the per capita base equation the level of significance was low (10 per cent). However, such analysis should be extended to other areas to have a better understanding of the relationship.

Cropping pattern and intensity are likely to affect rural household saving through their influence on on-farm physical investments such as land preparation, bunding, irrigation canals, weeding etc. Besides, a cropping pattern that emphasizes cash crops is likely to have a greater influence on saving. Prasad [112] found that regional variations in both the amount and pattern of investment in agriculture can be explained by variation in cropping pattern. However, as he himself pointed out the underlying data has two serious limitations in terms of the sample not being representative of the regions considered [112, p.60]. The influence of the level of technology is directly reflected through the investment opportunity.[38] Gestation period may have serious influence on the savings investment decisions of rural households, particularly small farmers and landless labourers. In Malaysia farmers were found to be reluctant to undertake replanting of rubber in old plantations because of the long gestation period involved in the process [144]. As expected, provision for irrigation and drainage

[38]P.G. Panikar [106] attempted to explain the inter-regional variations in investment by the variations in levels of technology, the technology effect being measured through growth rates in productivity, use of modern implements, consumption of fertilizers etc.

facilities have been found to have significant influence on the rural savings and investment in a number of studies in India, e.g., Ghosh [42], Desai [33], Misra and Mallick [84] etc. Habibullah [58, p.61] found that while there was a positive association between size of the landholding and agricultural investment, this relationship was affected by a number of other factors including soil types (fertility of the soil).[39]

Scope for land reclamation is likely to have positive influence on rural savings and investment but this will depend on a number of other factors such as availability of credit, inputs etc. In studies by Ghosh [42], Sisodia [139], and Misra and Mallick [84] degree of urban influence was found to be an important factor affecting rural savings and investment. Habibullah [58, p. 68] found that the regional variation in capital formation in rural areas was positively influenced by the amount of business investment. He also emphasized the role of natural hazards as a determinant on savings and investment in the rural economy [58, p. 67].[40] Finally, the status of the rural household in terms of caste and also in terms of its position in the rural hierarchy can influence both the pattern and volume of savings and investment.[41]

V. CONCLUDING REMARKS AND SUGGESTED GUIDELINE FOR FUTURE RESEARCH

From the analysis presented above, a number of essential features emerge that characterise the farm households' decision making universe. These can be put together to formulate a tentative framework which will integrate the various aspects of the decision making process of farm households.[42] It will be worthwhile, to take a look at some of the more important distinguishing characteristics of the farm households' decision making universe.

(1) Farm households make simultaneously production, consumption, saving and investment decisions.

(2) Farm households are heterogeneous. A large number of household groups can be identified on the basis of different socio-economic characteristics.

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[39]In the Muda River Project area in Malaysia it was found that soil type (acid or non-acid) had important influence on yield and therefore on farm income. Through farm income savings are likely to be affected.

[40]He also talks about the dampening effect of expenditure commited to socio-religious occasions on savings.

[41]For an interesting study of the Phulbani district in highland Orissa, see [12].

[42]One attempt at formulating farm-household decision making model was made by D.W. Adams and I.J. Singh [5]. Another model due to the present author was included in the fuller version of this paper prepared for the World Bank.

(3) Farm households face a choice of a number of production, consumption, saving and investment alternatives. The choice set of alternatives, however, differ among different household groups. Further, there are important variations over time also.

(4) Resource allocation decisions are closely linked with production, saving and investment decisions. More importantly, farm households' labour time utilization is also simultaneously determined.

(5) A significant portion of the production, saving and investment activities are undertaken outside the market economy. A large part of output is used up on the farm in home-consumption and own account capital formation.

(6) Farm households, main income originates partly from production for current use, partly from production for future use (e.g., non-monetized farm investment) and partly from sale or exchange of own labour outside the farm.

(7) Farm households' saving-investment behaviour is influenced by a number of economic, social, political and cultural factors.

It is obvious from the above that a very complicated structure will be necessary to model all of the aspects of farm households decision making universe. At the present state of the art of modelling, it seems one can focus attention only on a part of this universe and not the whole.

From the discussion above it is clear that our knowledge of rural savings and investment behaviour in developing countries is inadequate for effective policy formulation. It seems that there is need for further research in almost every aspect of rural savings and investment that has been touched upon in this paper. However, a few can now be highlighted for immediate attention so that a move could be taken towards developing an integrated framework within which policy measures to influence rural savings, and investment will be adopted. Some of these studies can be carried out on the basis of available data while for others new data may have to be generated.

(1) To begin with, a study should be initiated which will analyse the role of savings as an integral part of the overall system of social relationships. This implies that an economic-anthropological approach is necessary to understand the rural savings and investment behaviour. Such investigation can be carried out within the framework of village studies that are being carried out in different parts of the world. One shot-survey through questionnaire is unable to cope with this dimension of the rural savings study.

(2) It is also important to learn about the attitude of rural households towards savings. Two related questions are the following : (a) What kinds of reasons determine people to forego present consumption in favour of future consumtion ? (b) How far do the farmer's attitude and social habits affect the level and the pattern of saving and investment ? Rural household's attitude will be reflected in the type of goods withheld from consumption and the kind of estimate given to the future.

(3) A reconciliation of saving estimates by the income method and balance sheet method, on the one hand, and by non-institutional method and institutional method, on the other hand, should be attempted. Since such reconciliation can not be achieved with any set of data presently available, it may be worthwhile to undertake a comprehensive survey of rural households in selected regions. To begin with three types of regions may be selected; (i) regions where HYV technology has been successfully adopted, (ii) regions where cooperative movement has gained prominence in rural areas and (iii) regions where neither of the above has taken place. This will generate a wealth of data which along with those presently available can be used for testing a wide range of hypotheses regarding rural savings and investment behaviour.

(4) An important direction of research would be to carry out an intensive study of the state of rural capital markets in different regions and their effectiveness in mobilization and efficient allocation of rural savings to alternative uses. A related question is, how does the absence of an organised market for assets affect capital formation in rural areas ? This study should carefully look into the role of financial institutions and instruments in bringing the unorganised rural capital market into the fold of organized institutions. It will also be interesting to take a look into the question as to how useful is the idea of linking rural credit with saving.

(5) Three aspects of non-monetized physical investment should be further explored. (a) Problem of valuation and aggregation. (b) Estimation and valuation of repairs and maintenance and depreciation. (c) Quality (productivity) of rural savings and investment in physical assets.

(6) Farmer's decision making model hinted in this paper should be developed fully and attempt should be made to empirically implement it. This should be extended further and integrated into a comprehensive regional model for rural development.

(7) For mobilization and utilisation of rural savings, an important research direction would be to examine the implication of intra (within rural areas) and inter-sectoral (between the rural sector and the urban sector) flow of funds for income growth and distribution in rural areas. This discussion should be carried

out in the light of three options available to the rural household regarding the disposal of saving; self-use, direct transmittal to user and indirect transmittal to user.

(8) Related to the above would be a study which will undertake careful analysis of the determinants of financial asset acquisition in rural areas of developing countries. Here, two important questions of policy relevance are the following :

(a) How does monetary rate of return and inflation affect individual's saving in financial assets ? (b) How could one transform the non-productive financial asset acquisition by rural households into productive investment ?

(9) The relationship between distribution of income (size and functional) and rural savings should be explored more deeply. In this context the influence of size of landholding as well as distribution of landholding on the level and pattern of rural savings should be considered.

(10) The mode of cultivation and the law and customs governing the sharing of costs and return are said to have significant influence on savings in rural areas. This aspect of the issue should be studied along with its implications for adoption of new technology in agriculture.

(11) What is the impact of "green revolution" on the savings and investment behaviour in rural areas ? To answar this question it will also be necessary to analyes the impact of "green revolution" on income and asset distribution in different parts of the developing world. Here the basic question is, will the marginal propensity to save among rural households change with the introduction of new technology ? In essence, this study needs to be carried out within a framework designed to analyse the relationship between production possibility, level of technology and rural savings.

(12) An extremely important direction of research would be to examine the present and the potential role of government and cooperative organizations in mobilisation and productive utilisation of rural savings. Here the feasibility of linking development finance by the government to local contribution (in cash and kind) should be studied. Furthermore, it is also necessary to analyse the impact of taxation on income and wealth in rural areas on the level and pattern of savings.

(13) Influence of demographic characteristics on rural savings is not yet clearly established. Further work along this line should be very useful.

(14) Influence of interest rate and prices on rural savings requires further in-depth study before any general consclusion can be derived either for the developing world as a whole or a part thereof.

(15) A no less important topic for future research than those mentioned above is the influence of rural market structure on rural savings. This will obviously require a very intimate knowledge of the workings of rural market (both formal and informal).

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Abbreviations Used :

PEJ	*—Pakistan Economic Journal*
BDS	*—Bangladesh Development Studies*
BER	*—Bangladesh Economic Review*
PDR	*—Pakistan Development Review*
IJAE	*—Indian Journal of Agricultural Economics*
EPW	*—Economic and Political Weekly*
EDCC	*—Economic Development and Cultural Change*
RBIB	*—Reserve Bank of India Bulletin*
IEJ	*—Indian Economic Journal*
ER	*—Economic Record*
EJ	*—Economic Journal*
PLEJ	*—Philippines Economic Journal*
RESTAT	*—Review of Economics and Statistics*
JEL	*—Journal of Economic Literature*
RIW	*—Review of Income and Wealth*
JDS	*—Journal of Development Studies.*

A Development Perspective for Bangladesh

by

J. Faaland And J. R. Parkinson*

I. THE OUTLOOK FOR CHANGE

A main purpose of this analysis is to examine whether, how and how far the lot of the inhabitants of Bangladesh might be improved by the end of the century and to gauge how much assistance from outside would be necessary to support the development of the economy at a realistic rate.

An imaginative solution to the difficulty of the absence of good data for Bangladesh was devised by Professor Robert Dorfman[1] and those associated with him in developing a model based on relationships chosen from the experience of other countries bearing some resemblance to Bangladesh in their stage of evolution and characteristics. The objective of the Dorfman model was to determine the amount of foreign assistance that would be needed by Bangladesh, if a reasonable level of employment were to be maintained. Ingenious and sophisticated as this approach is and in spite of the flexibility with which it can be applied, it is far from clear that it makes proper allowance for the peculiarities of Bangladesh's economy and its institutional problems. To some degree countries do follow similar paths of development, as Simon Kuznets has demonstrated [4]. Some of the suggested structural changes will manifest themselves in Bangladesh if development really gets going, but it is not to be expected that there will be any close imitation of the development paths followed by other countries; moreover, there may have to be a conscious effort to direct the pattern of development differently in order to cope better with the extreme poverty that Bangladesh is likely to experience for a considerable time and to make it more bearable.

The task we have set ourselves is to look beyond the next few years to draw an overall picture of Bangladesh's potential for continuous and longer term structural change and development. As an aid to presentation, rather than as the core of the argument, we have summarised our assumptions, prognostications, judgements and analysis in Table I.

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*The authors are respectively, Director, The Christian Michelson Institute, Bergan, Norway and Professor of Economics, University of Nottingham, England. This article will be published in a modified form as a chapter in a forthcoming book by the authors [2].

[1]This model has not been published, but is summarised in a World Bank study on agriculture and water development issued in 1972. A member of the staff of the B.I.D.S., Dr. M. Alamgir, participated closely in the design and elaboration of the model.

TABLE I

DEVELOPMENT SCENARIO 1975 to 2000

(Values in Approximate 1974 Prices in US$ Equivalent)

		1975	1980	1985	1990	1995	2000
A.	**Population and Major National Accounts Magnitudes**						
1.	Population (million)	80	93	106	121	136	150
2.	Gross Domestic Product (mill. $)	6400	8170	10930	14630	19610	26140
3.	Gross Investment ,,	550	1225	1965	2635	3530	4710
4.	Net Capital Import ,,	800	980	1310	1465	1570	1570
5.	Domestic Savings ,,	—250	245	655	1170	1960	3140
6.	Consumption ,,	6650	7925	10275	13460	17650	23000
7.	Gross Product Per Capita ($)	80	88	103	121	145	174
8.	Consumption Per Capita ($)	83	85	97	111	130	153
9.	Domestic Savings Per Capita ($)	—3	3	6	10	15	21
10.	Gross Investment as Per Cent of GDP	8	15	18	18	18	18
11.	Capital Import as Per Cent of GDP	12	12	12	10	8	6
12.	Domestic Savings as Per Cent of GDP	4	3	6	8	10	12

		1975-80	1980-85	1985-90	1990-95	1995-2000	1980-2000	Total Growth Index 1975-2000
B.	**Annual Growth Rates and 25 Year Growth Index**							
13.	Population	3.0	2.8	2.6	2.3	2.0	2.4	187
14.	Gross Domestic Product	5.0	6.0	6.0	6.0	6.0	6.0	401
15.	Gross Investment	17.4	10.0	6.0	6.0	6.0	7.0	855
16.	Gross Product Per Capita	2.0	3.1	3.3	3.6	3.8	3.5	218
17.	Consumption Per Capita	0.6	2.5	2.9	3.2	3.3	3.0	184
C.	**Selected Ratios**							
18.	Capital-Output Ratio	(2.0)	2.7	3.0	3.0	3.0	3.0	n.a.
19.	Marginal Overall Savings Rate (per cent)	(28)	15	14	16	14	16	n.a.
20.	Marginal Per Capita Savings Rate (per cent)	(62)	32	24	20	22	21	n.a.

For our discussion of potential development to the end of the century we need a base against which to measure change. For the sake of comparison we have chosen to present our best estimates for the current year, 1975.[2] It is a comment on the state of basic information and statistics about the Bangladesh economy, that the base figures have to be somewhat arbitrary.

At the time of writing there is still considerable uncertainty with respect to the size of the population (and even more the momentum for further growth inherent in current demographic characteristics). Our estimate of 80 million for mid 1975 is roughly consistent with current Government estimates and also with the provisional figures obtained from the 1974 population census, if the latter as in previous censuses reflects an under-enumeration of 5 to 8 per cent.

The estimate of gross domestic product in total or per capita is even more uncertain. Available estimates for previous years differ and in any case need to be adjusted for changes in prices and volumes for recent years. For the purposes of these comparisons, we shall use a base year (1975) figure of 80 US$ equivalents for per capita GDP. This is higher than the figure for gross national product of $70 used by the World Bank [7] in its international comparisons (for an earlier year and at different prices and exchange rates),[3] but with the present inflated domestic and international prices of Bangladesh's major crop: rice, our estimate of $80 may in fact be on the low side.

Gross investment in our base year (1975) is bound to be low—perhaps roughly as in 1974. Our estimate of $550 million includes both public and private investments.

Net capital imports or the value of the overall current import surplus of $800 million in the base year (1975) corresponds to disbursements in 1974/75 as expected following the meeting of the Bangladesh Consortium in October 1974 and subsequent experience with actual aid arrivals.

The four estimates described above determine the structure of the economy in our base year 1975 as shown in Table I, including levels of overall and per capita consumption and savings. The picture drawn reflects the extremely low level of production, income and productivity in Bangladesh, the relatively very large addition to domestic production represented by foreign assistance (corresponding to more than 10% of total use of resources in Bangladesh), and the dependence of Bangladesh on foreign supplies for investments and for food and other consumption items.

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[2]Note that estimates in Table I are in approximate 1974 prices.

[3]The difference in concepts used, GDP versus GNP, is numerically insignificant for the purpose of our discussion.

Numerically, our picture of development and change over the period to the end of the century as given in the Table is generated from our assumptions and judgements about the future course of development of population, gross domestic product, gross investment, and the proportion of investment financed from net imports and domestic saving. Each of these major parameters is analysed in the following sections.

II. POPULATION

As a matter of practical judgement it is hard to believe that there is any hope of checking the growth of population at all speedily, so long as it can be fed. But every year lost in making progress in this respect makes the problem more difficult. In the first four years after the creation of Bangladesh, virtually nothing has been accomplished to stem the rise in population. How long will it take to mount an ambitious programme? How effective could efforts to check the rise in population be once a large enough programme were put in hand? Realistically it seems unlikely that Bangladesh will mount any effective programme for the control of population within the next five years. The programme so far as it has gone is weak and ineffective. In the Annual Plan for 1974/75 it is said : "The targets for 1973/74 were modest and not achieving these targets would cast doubts about the objective of slowing down the population growth rate" [5,p.176]. The Plan goes on to put its faith in the effects of the organisational changes that were introduced in 1973/74. With the experience of other countries in mind it may be doubted if the claim to have reduced the number of births in 1973/74 by as much as 40,000 will prove to have been well founded; but even if it were, it would amount to no more than 1 per cent of the total births that in fact occured in that year. Even if this is regarded only as a start it will be several years before the programme builds up to a level at which it will have a real effect. There is nothing as yet to suggest either that the actual population growth rate is less than 3 per cent per annum or that it would fall to less than 2 per cent within the next 25 years. It may not fall at all and that would mean that the population would more than double by the end of the century. Still less does it seem credible that the reproduction rate would fall by the end of the century so as to reach a level corresponding to an ultimately stationary population. Thus, in reflecting on the future, it is reasonable to assume that the population will increase for a while at something like, the present rate of 3 per cent per annum on the average, slowing down it may be hoped as time goes on. A simple assumption of 3 per cent annual growth of population to the end of the century might well be unduly pessimistic, but to alter the assumption to one of a gradual decline in the growth rate as time goes on makes uncomfortably little difference to the arithmetic of the population

size in the year 2000.[4] It does make a much more significant difference, however, to the momentum for further growth in the next century.

III. FOOD AND AGRICULTURE

In the past Bangladesh has managed to increase her output of rice quite significantly. Between the early 1950s and the late 1960s production of rice increased by 40-50 per cent. The increase did not quite keep pace with the increase in needs but the balance was not too greatly disturbed. The opportunities to continue to increase output of food are still there; in many ways they have been enhanced. How quickly they will be taken advantage of is a matter that is difficult to determine. The scope for an increase in output stems from the basic fact that although the soil and climate favours rice cultivation, yields are low and much lower than is technically possible.

The means to increase yields are well known; the rate at which they can be applied is not. There is very little prospect of being able to increase the acreage of agricultural land in Bangladesh, indeed it will almost certainly be reduced because of the need to increase the use of land for other purposes as population increases. Increased output of foodgrains depends on increasing the productivity of land by using improved types of seeds and fertiliser, by irigation, by drainage and flood protection and by expanding the acreage under multicropping.

The potentiality for increased production has been studied in great detail by the World Bank. The conclusions reached are both tentative and intricate, but they may be illustrated by a picture of development to the end of the century as follows : by changing the inputs, alone, that is to say by introducing new seeds, fertilisers and pesticides, it would be possible to double rice output; if irrigation were also practised to the fullest extent, output could be trebled, while with the further addition of drainage and flood control it would be possible to quadruple output. Economic constraints were not taken into account in reaching these conclusions. The cost of increasing output rises progressively as additional measures become necessary and the whole of the improvements that could be made economically within the limits of presently known technology would realistically take several decades.

Historically, an increase in rice output of 3 per cent per year would seem quite large, but this has been within the reach of Bangladesh in the past, and it ought to be possible to do better in the future. Extrapolating from the experience of

[4] A 3 per cent rate of growth over 25 years gives a population size at the end of the century about 10% larger than a growth rate declining gradually from 3 to per cent during the same period.

other countries adopting the use of new techniques it can be expected that to increase rice production in Bangladesh by as much as say 4 to 5 per cent per annum provided that a determined development programme is carried through. Allowing for opportunities to increase double cropping, it does not seem too unreasonable to suppose that output of grain might increase at an accellerated rate compared with the past and that there would be a good chance of increasing domestic foodgrain supplies more rapidly—perhaps up to 2 per cent more rapidly—than population. Also for the agricultural sector generally, i.e., including all crops, livestock, forestry and fisheries, an average annual rate of growth of value added of 3 to 5 per cent ought to be attainable until the end of the century.

The assumption that it will be possible to increase output of foodgrains per capita at the rate of 2 per cent per annum holds out the prospect of attaining food self-sufficiency and ultimately, possibly, of exporting food. It also provides some indication of the extent to which it might be possible to generate savings for the finance of development from the increase in agricultural incomes, following the well worn economic argument that it is out of the surplus over subsistence that economic growth may be generated.

One of the difficulties in assessing when food self-sufficiency can be attained is that increased production of food will inevitably give rise to an increase in the consumption of food by the producers themselves. Very little is known with certainty about how the consumption of foodgrains will increase with increased income. Estimates have varied greatly for Bangladesh as well as for other developing countries. As a working assumption it might be reasonable to conclude that foodgrain consumption will increase *pari passu* with the increased population currently 3 per cent annually, plus 1 per cent annually to meet higher levels of consumption by producers themselves, leaving only one out of the assumed maximum of 5 per cent increase in rice production for increased sales on the market.

If this proved to be a valid assumption, about an additional 100,000 tons of grain would become available year by year for sale during years of normal harvests. Such a rate of progression may seem much too slow. It would mean that imports of food would diminish only slowly and would take nearly the whole of the period to the end of the century to be eliminated. If consumption per capita could be kept down to its present level, the time to self-sufficiency would be shortened but it might still take ten years. In the First Five Year Plan it was assumed that it would be possible to attain self-sufficiency in the plan period: this was too optimistic but it underlines the need to increase production more rapidly than seems likely to occur without a good deal of stimulation. As Akhter Hameed Khan

[3] has pointed out in his fascinating survey of events, in every crisis in Bangladesh agricultural policy is subjected to the concept of a crash programme. That, of course, is what is needed, but crash programmes seldom materialise as effective stimulants.

IV. OVERALL GROWTH AND INVESTMENT

We need now to make some assumptions about the rate at which output of other sectors of the economy may increase. The output of a number of them will be linked to that of agriculture, particularly because this will determine the amount of resources that can be channelled to them. From historical comparisons and on general grounds we would expect them to increase rather more quickly than agricultural output. In industry, for example, an increase of 10 per cent per annum or more can be attained, and civil works might be increased even more rapidly with the object of increasing employment. We conclude that a rate of increase of 7 per cent on the average for non-agricultural output would be a reasonable figure to take. This again is probably at the top end of the scale and it may take some time to realise it.

Put in the simplest terms, it seems practicable to us for Bangladesh to increase value added in agriculture by 4 to 5 per cent per annum and in other sectors of the economy by 6 to 7 per cent per annum, which would mean that overall GDP would grow by about 5 to 6 per cent per annum in total, roughly doubling GDP per capita over the 25 year period. This will mean that the share of agriculture in the total product will fall slightly and that from being somewhat more important than all the other sectors combined, it will become somewhat less important.

Between capital investment and production of output there is necessarily a lag, for an economy such as that of Bangladesh, of perhaps two years on the average. We have postulated that development expenditure will remain at the present relatively depressed level for one or two more years, and then roughly double by 1980, and eventually reach 18 per cent of GDP in the early or mid 1980s. At these levels of investment we calculate that a sustained rate of growth of 6 per cent of GDP would be attained and maintained throughout the rest of this century.

V. SECTOR BALANCE AND STRATEGY

The levels of gross investment derived above—reaching 18 per cent of GNP by the early or mid 1980s—are large enough, if sustained, to effect a gradual but definite change in the structure of the economy and to double the standard of living in the span of a generation. If this is to happen, however, the use of investment resources must be carefully and comprhensively planned in order to ensure a

sustained increase in output of goods and services of high social as well as market value. This is a major undertaking but one which is essential if the government is to be able to see what the future could be made to hold and to be in a position to make the choices that will be open to it. It is no less essential in order to adopt policies and priorities for immediate and medium term action by the government.

The First Five Year Plan of Bangladesh for the period to mid 1978, which was prepared in 1972/73, represents a beginning of such an effort. While subsequent events have radically altered the basic structure on which the details of the Plan were formulated, it still gives an incisive and explicit statement of basic ideology, objectives and general strategy of development for Bangladesh. The First Five Year Plan was drawn up in the expectation that a quick return to immediate pre-independence levels of development effort was possible and it produced what later turned out to be rather optimistic estimates of what might be accomplished in the first five years; in the present situation we cannot set our sights so high. Amongst other things the Plan discussed how development expenditure should be allocated between sectors on the assumption that more resources would be available for development than can be provided in the next few years.

Table II compares the last development plan drawn up for East Pakistan before Independence with that planned in Bangladesh's First Five Year Plan, and with the Annual Development Plan for 1975/76. The various categories of expenditure are almost certainly not entirely comparable, for classifications have changed from one plan to the next, but differences of definition are probably small enough to allow some tentative conclusions to be drawn. In real terms the magnitude of expenditure proposed in the First Five Year Plan drawn up by Bangladesh was about the same order of magnitude as that intended for East Pakistan during the five year period 1970-75, but the composition of expenditure was very different. Rather more than 40 per cent of expenditure in the plan for East Pakistan was intended to be spent on agriculture and rural activities; in the Bangladesh Five Year Plan only about 25 per cent of expenditure was expected to be spent in this way. In the annual plans for 1974/75 and 1975/76[5] the balance has been changed so that about one-third of expenditure is intended for agriculture and rural development. How far this is the result of a deliberate attempt to increase the share of agricultural activity and how far it is the result of financial stringencies falling unevenly on different activities is a matter for conjecture. To concentrate development activity on agriculture is clearly right in conditions of stringency and

[5]The 1975/76 Annual Plan appears to be about the same magnitude in real terms as the development expenditure planned originally for 1972/73. It represents the mid-year of the Five Year Plan.

TABLE II

DEVELOPMENT PROGRAMME FOR BANGLADESH

Sectors	Crores Rupees or Takas			Per Cent Distribution		
	Pakistan 4th Plan 1970-75	Bangladesh First Five Year Plan	Bangladesh Annual Development 1975/76	Pakistan 4th Plan 1970-75	Bangladesh First Five Year Plan	Bangladesh Annual Development 1975/76
Agriculture & Rural Activities						
Agriculture	470	326	115	17.9	7.3	12.1
Rural Development	200	163	48	7.6	3.7	5.1
Water and Flood Control	450	578	136	17.2	13.0	14.3
Sub Total	1120	1067	299	42.7	24.0	31.5
Industry & Allied Activities						
Industry	300	1075	136	11.4	24.1	14.3
Transport & Communications	300	708	160	11.4	15.9	16.8
Power & Natural Resources	294	522	151	11.2	11.7	15.9
Sub Total	894	2305	447	34.0	51.7	47.0
Public Services						
Physical Planning & Housing	190	451	66	7.2	10.1	7.0
Health, Family Planning	184	253	58	7.0	5.7	5.9
Social Welfare & Manpower	15	65	7	0.6	1.5	0.7
Education	223	314	45	8.5	7.0	4.8
Sub Total	612	1083	176	23.3	24.3	18.4
Cyclone Reconstruction			28			2.9
Grand Total	2626	4455	950	100	100	100

one in line with the strategy necessary to get living standards improved over the next twenty five years. It is possible that expenditure on agricultural development was circumscribed in the Bangladesh Five Year Plan by problems of devising programmes which would be productive,and by fears that the inputs needed to launch a really large agricultural campaign would not be forthcoming. However, there is a clearly considerable scope for increasing development efforts in the countryside once the groundwork of organisation is laid; there would be much to be said for attempting to spend, say, half of development expenditure in the villages on activities aimed at increasing food production and improving rural amenities, the provision of improved health care and fostering family planning.

In contrast to agriculture, the First Five Year Plan of Bangladesh increased the amount of expenditure intended for industry by comparison with previous plans. There were some special reasons for this, notably the need to increase the output of fertilisers and the desire of Bangladesh to exploit her resources of natural gas in other ways. The production of urea is needed to support the agricultural programmes and to increase exports if there is anything to spare. It is seldom possible to look at sectoral investment plans in osolation and this is a case in point. Nevertheless, in total, expenditure on industrial development needs to be held back when it is in danger of leading to the neglect of agricultural development either because of the limited amount of money that can be spent on development or because of a shortage of administrative talent.

In reflecting on the priorities of development it is helpful to bear in mind the intended future pattern of consumption. If the emphasis of development is laid on improving the lot of those living in villages, investment and production programmes will have to be devised accordingly. This means, for example, directing production of consumption goods to those items which can be economically produced for mass consumption.

Neglect of the simpler needs will lead to investment programmes directed too much in the direction of the requirements of rich, sophisticated and materially orientated societies which Bangladesh cannot afford. Basic needs of the many must come first and the resources available for development have to be channelled accordingly. For education the strategy should be directed primarily to the needs of the village population and to educating them to make the best use of the opportunities open to them in their own invironment. All these considerations point to the need to change quite radically the style of the development effort outlined in the First Five Year Plan, and to shift much of its focus to the villages and to local rather than central administration. But it is a shift in the balance that is required, not a change to the total exclusion of other activities.

VI. DOMESTIC RESOURCES FOR DEVELOPMENT

The realism of an investment programme aimed at investing the equivalent of 18 per cent of gross domestic product in five or ten years time requires to be considered in relation to domestic savings and the provision of resources for investment from abroad. We take the view that domestic savings cannot, and should not, be counted on to finance the full investment bill, either in the immediate situation or in the future. Even by the year 2000 we assume that domestic savings levels will reach no more than 12 per cent of the gross domestic product or two-thirds of investment; the rest we assume should be covered by foreign aid and other net capital import.

The immediate effort needed to increase savings is quite considerable. Currently, Bangladesh saves nothing; in fact we judge that the need to import food has meant that Bangladesh, in a strict accounting sense, is dissaving quite considerably.[6] To move from this to positive savings of perhaps 3 per cent of GDP by 1980, will require a considerable effort. Yet, in striving not to be over-ambitious, we recognise that there are strong arguments for increasing domestic savings as rapidly as possible, provided that this can be done without causing political or economic unrest of a counterproductive kind, and that the savings can be used productively and will not go to waste for lack of complementary inputs, notably imports needed for development.

Bangladesh's saving record [1] does hold out some hope of mobilising resources for development. Any increased growth of output in excess of growth of population will raise the potentiality to save. This is particularly important in terms of the food balance. Even though food self-sufficiency may not be attained for ten years or more, growth of output in excess of population will progressively help the balance of payments and provide the means to increase imports of other goods, including those needed for the development effort. It could also be the means of providing domestic resources for development. But if this is to occur it will be essential to devise policies that will prevent increases in production of foodgrains from being frittered away. Increased consumption and smuggling could rapidly devour any incipient surplus that might be developed. The ways in which this might be frustrated include taxing farmers to a much greater degree than is done at present, the active procurement of grain from the villages and, as an inducement to sell grain, the provision of adequate supplies of consumer goods in the rural areas.

[6] In national income accounting a deficit on the balance of payments is conventionally regarded as financing investment. In fact it should be remembered that foreign aid is also intended to finance consumption, for example, the import of foodgrains.

It is, however, difficult to judge with confidence what success policies of this kind might have.

As indicated above, it is doubtful if even the most vigorous policies will make it possible to capture more than one-fifth of increased food production for domestic savings and improved balance of payments. Nevertheless, even this—if it could be secured—would represent a substantial increase in domestic resources for development. It would mean adding cumulatively to savings each year the equivalent of perhaps as much as ½ per cent of the GDP of that year.

The increase in income generated in other sectors of the economy also add to the potential for saving. Only at the end of the period we consider will other sectors combined be as important as that of agriculture in terms of net output, but they will be easier to tax in certain respects. The activities of industry and commerce lend themselves to the imposition of indirect taxes; construction of buildings adds to the rates; expansion of transportation activities gives the opportunity to raise money from taxes on fuel or through appropriate pricing from the profits of the nationalised transport sector. Expansion of some other sectors is less productive of public sector receipts and savings. Education is seldom paid for by the general public, the output of civil servants is often not taxed and if it is, simply adds to expenditure; but all these activities, while providing additional incomes from which personal savings can be generated, also help to swell indirect revenues to Government.

In summary, it ought to be possible over time—and provided development in fact proceeds as envisaged—to increase domestic savings from its present low (probably negative) rate to 10 per cent or more of GDP towards the end of the century. With population then increasing by perhaps 2 per cent this would allow a margin for addition to capital from Bangladesh's own resources beyond what is required just to replace old capital and put the additional population on the same level as those already living in Bangladesh in terms of the capital stock with which they work.

VII. FOREIGN AID AND CAPITAL IMPORT

No attempt is made in Table I to predict by how much exports and imports will increase in the next twenty five years although the balance between them, representing a new inflow of resources, is shown. A net import of resources could be consistent with varying levels of trade but we are assuming that a policy of encouraging the flow of trade will be followed. In this case the supply of exports that can be made available will be the determining factor. For the next five years the trend of exports seem unlikely to be a rising one; the prospects for exports

of jute and manufactures are rather bad and the supply of other exportable goods, whether new or traditional is also unlikely to increase very much. One result of this is that the value of imports will not increase very greatly between 1975 and 1980. Nevertheless, what is suggested will represent an appreciable increase over the average of 1973/74, perhaps as much as 20 per cent. The position would be improved further if the fall in prices of imported goods, started in 1974, enabled Bangladesh to secure some continued improvement in her terms of trade and, more important, to the extent that output of foodgrains increased so that money spent on importing them (including foodgrains provided under aid) could be diverted to other purposes. Even so the import position will remain tight in spite of the fact that the value of imports might amount to about 20 per cent of the gross domestic product over the period 1975-80. If imports were to continue to represent the same proportion of gross domestic product as the latter increased over the years, exports would have to increase considerably until in the year 2000 they amounted to about 14 per cent of the gross domestic product, compared with about 8 per cent before 1975. This might be possible in favourable circumstances.

The net capital import shown in Table I will be less than the amount of aid that will be necessary. The reason for this is that Bangladesh already has existing debts to service, and dependent on what proportion of the foreign assistance placed at her disposal is in the form of loans and the terms on which these are made, a considerable burden of debt service could accummulate by the year 2000. Thus at that point of time the total of foreign assistance necessary to provide for the inflow of resources required as well as debt service might be as much as say £2,000 million, compared to the net figure of £1,570 million given in the table. This is a large sum which, however, has to be seen in relation to the need to assist about 150 million people who certainly at that date will still be amongst the poorest in the world. An increasing flow of aid over a period of twenty five years is contrary to the usual picture of giving assistance which it is presumed will bring the recipient country within a few years to a position where it can progressively be able to do with less help from others. In the context of Bangladesh the standard picture makes little sense. As implementation capacity improves, it will be possible to use increasing amounts of resources effectively and accelerate the measures needed to improve living standards and bring about population control.

In spite of the suggestion that aid should be increased untill atleast the end of the century the proportion of the net import of capital to gross investment would diminish to only one-third; in 1975 aid will virtually be financing all development expenditures. The present need to help with the maintenance of

consumption reflects, of course, the poverty of the country and the amount of foodgrains which have to be imported to prevent starvation.

VIII. EMPLOYMENT

There are vast reservoirs of unemployed and underemployed labour in Bangladesh. It may be surmised that if work were available the number of man-days utilised might increase by rather more than one-third. With the kind of investment opportunities that can effectively be opened up and financed with the resources that are likely to be available, it is quite impossible to think that any real inroads will be made into the problem of employment.

A rough analysis of the occupations of the present population of Bangladesh is given in Table III, together with illustrative figures for the year 2000.

There is scarcely any possibility that the increase foreseen in agricultural production can give rise to any great increase in employment. New techniques in agriculture do offer increased employment in a number of ways. The application of fertiliser, the use of irrigation facilities, better preparation of the land and the increased effort needed to sow, plant and harvest a larger crop all add to the labour input. Often, however, the increase in labour needed is not great. For some crops labour requirements double with the full use of modern and productive techniques; but in most cases the increase is no more than 50 per cent and often it is less. It seems extremely doubtful if the amount of employment that the land can offer can be increased by more than one-third on the average,

TABLE III

EMPLOYMENT BY ECONOMIC SECTOR AND TOTAL LABOUR FORCE 1975 AND 2000

(Illustrative Catculations of the Incidence of Unemployment)

Sectors	Million man years	
	1975	2000
Employment in :		
Agriculture	15	20
Manufacturing	1	4
Commerce	1	2
Services	2	6
All Other (including construction)	1	4
Total Employment	19	36
Unemployment	8	20
Total Labour Force	27	56

Note : The figures for 1975 are rough estimates only, based on incomplcte information. They must be considered only as indicative of the structure of occupations rather than absolute levels.

an additional 5 million jobs. When allowance is made for the growth of jobs in other sectors it seems likely that the number of unemployed will increase from something like 8 million to 20 million by the end of the century.

It is necessary to consider this conclusion in relation to agriculture and its implications for development in this sector. The fact that land in some regions of the country will respond much better to the use of modern techniques than in others will itself make for inequality in incomes; so will the fact that individual plots of land will lend themselves better to prior introduction of the new techniques and that some owners will prove to be more pushful in securing the inputs needed and more energetic in applying them. Thus inequality of income amongst farmers is likely to increase. This effect will be aggravated by the fact that the numbers of people who have no land will increase much more than the amount of additional employment that the land can be expected to offer.

The difficulties will be at their most acute for the landless. They may seek a solution by moving to other occupations outside agriculture and by migrating to the urban centres, but without much prospect of success, unless a vastly greater investment programme can be introduced that appears to have any prospect of feasibility.

Output of manufacturing might possibly increase eight or even ten-fold over the period we are considering but even if it did, the number employed in manufacturing could hardly be expected to increase more than five-fold. In fact the increase is almost certain to be smaller unless the unions insist on enforcing some massive system of work sharing. This is not so far fetched as it appears, for many of the factories are in fact greatly overmanned at the present time and may remain so for the future. However, it seems unlikely and also undesirable on general grounds that there should be any increase in the relative overmanning of industrial enterprises. Also it is to be expected that the general development of technology will in fact increase labour productivity in spite of policies that may be envisaged for making greater use of intermediate technology, better use of capital through shift working, and by concentrating on industrial sectors in which the labour capital ratio is greater. The major opportunities for increasing employment outside agriculture and manufacturing lie in building and construction and in the service sectors.

The above line of reasoning, insecure as it is, strongly suggests that the present system of ownership of land within a market orientated economy would not function. The essential wealth in Bangladesh is land. It is this that guarantees employment. The average holding of land at the present time is less than three acres; if population continues to increase, as we have supposed, the average

holding will be down to less than 1½ acres. This would be enough on average land to feed a family on our suppositions of the increased yields that can be produced. It seems inescapable that there will be great pressure to secure at least this amount of land. In all probability land will have to be allocated to the landless at the expense of those with larger land holdings, if political stability is to be maintained. Such a step will obviously be an extremely difficult one to take. Some measure of expropriation seems quite inescapable, however. If it were certain that the rise in population would finally have ended by the turn of the century, expropriation and land redistribution might have been a possible solution. But so long as the population continues to increase there will be a continuing need to redistribute land. The alternative of a state takeover of all land of Bangladesh might be a better answer in some respects. Under state or communal management it is possible in principle, although not very readily in practice, to give employment creation and work sharing, explicit and separate weight along with output expansion and financial cost efficiency.

IX. CONSUMPTION

If the rate of increase of output that we think possible is in fact accomplished over the next quarter of a century, what effect will this have on life in Bangladesh? In the first place it is clear that there will be no great change in the life style of the inhabitants of the country. Consumption will have to rise at a lower rate than the increase in output, otherwise no resources will be available for development; this is particularly so in the first five or ten years. On our calculations, per capita consumption would not quite double in one generation of 25 years. This would be a very real amelioration of the situation in Bangladesh but no transformation. Income per head at the end of the century would be no higher than roughly the equivalent of that of Pakistan or China at the present day. Bangladesh almost inevitably will remain the poorest large country at the end of this century, but it may by then also have become a country in which development has taken hold.

The results of the projected increase in agricultural output on welfare are not easy to predict. The nation will continue to be undernourised for a long time to come. Much of the increase in output which we have argued can be secured will be needed to replace imports of foodgrains. We have also assumed that Bangladesh will be able to increase output of other crops to some extent in line with the increase of rice production. There is hardly any branch of agriculture that does not present considerable opportunities for improvement, yet, to move from a diet of foodgrains supplemented to some extent by fish, animal products, fruit and vegetables to one containing significant amounts of the more attractive and nutritious foods is a costly process. It will also require greater knowledge, and knowledge of a different kind, on the part of the farmers and their families than that

needed for adopting new methods of rice cultivation which apparently are now spreading. The diet may be improved in 25 years but it will still be deficient in many ways for the majority of the population.

Models such as that developed by Dorfman imply that there is some predetermined pattern of production and consumption which economies may be expected to follow. This is far from certain in practice; in principle it is certainly not inevitable. Might it be possible to introduce into Bangladesh a pattern of consumption radically different from that of most countries and still get the same or a higher consumer satisfaction from it ? Such a question is almost impossible to answer, but it has to be asked. Consumer's tastes are susceptible to alteration or there would be little point in advertising campaigns; individuals do in fact differ greatly in their tastes and what they wish to consume depends very much on their environment.

In the case of Bangladesh there would be something to be said for attempting to mould the pattern of consumption away from some aspects of the materialistic pattern of Western societies. The shifts that would bring most benefit would concentrate on patterns of consumption of goods over and above minimum needs of basic foods, elementary shelter and clothing, the shift would in general be from goods to services, and from goods that are heavily dependent on imports to those that are more completely domestically produced. It might be possible for instance to concentrate in Bangladesh on having a very high standard of basic education available for all; to develop a village health service of high repute, to direct demand to the provision of housing where this can be done without making heavy demands on imported goods and, perhaps more important, to avoid the wholesale use of the motor car against which so many countries and towns plagued with traffic jams and pollution are now revolting. Are the stresses and strains of "modern consumerism" really worth it ? Can alternative patterns of living be developed which would give greater satisfaction ?

It will not be easy to steer the direction of change in the general pattern of demand. There is every indication in Bangladesh that the wealthy wish nothing better than to follow the patterns of consumption laid down in the West. The tendency to prefer the motor car, airconditioners, luxury houses and foreign travel to other things on the part of the wealthy is well ingrained and it will not be easy within the present social and economic system to bring about transformation in attitudes.

X. CONCLUSIONS

It is clear from the foregoing that there is little reason for optimism about the future of Bangladesh. The simple arithmetical processes that we have gone

through offer little reassurance that standard of living can be greatly raised by the end of the century. We believe that the assumptions on which we have worked are reasonably realistic. We hope that things will be better than we envisage; but fear that they may be worse. Over everything hangs the uncontrollable increase in population that will make a drastic shortage of land and of employment opportunities even more severe. We have tried to suggest some ways in which the situation can be ameliorated, but we think that the difficulties of dealing with the economy are bound to create circumstances of great social instability in the future.

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Land Reform and Agrarian Change in Bangladesh*

by

Abu Abdullah**

I. INTRODUCTION

It is by now widely acknowledged that development requires the creation of a productive agriculture, and that this in turn requires in most cases more or less far-reaching changes in the agrarian structure. This is true even if development is narrowly defined as a sustained rise in the volume of goods and services available for consumption per head of the population, and true *a fortiori* if we want to focus on the alleviation of mass poverty as a defining concomitant of development.

For the area that now constitutes Bangladesh, a backward agrarian structure—itself no doubt partly a heritage of a long history of colonial exploitation —has borne the major share of responsibility for prolonged stagnation, and persistent poverty. The main characteristics of the agrarian structure as it exists today are high man-land ratios, tremendous fragmentation, a high degree of landlessness, predominance of production for subsistence, preponderance of minifundist "family farms", and primitive technology.

The relation between agrarian structure and development is one of complex interaction rather than unilinear causation. It is not my purpose to discuss these issues, but simply to describe the more important attempts that have been made in this part of the world to purposefully change the agrarian structure, and to evaluate the consequences.

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Definitional niceties need not detain us long. If "Land reform proper" is to mean simply "the redistribution of property or rights in land for the benefit of small farmers and agricultural labourers", as Doreen Warriner says, [34, p. xiv], then we would soon run out of things to say about Bangladesh, and would besides be forced to neglect some of the most potent agents of change working on the agrarian structure. I propose to discuss mainly The East Bengal State Acquisition and Tenancy Act, 1950, as modified from time to time, its implementation, and its impact on the agrarian structure, including effects on productivity, efficiency, and power.

II. THE AGRARIAN SCENE BEFORE 1950

Under British rule the province of Bengal was a "Permanently Settled" area, which meant that most of the land was parcelled out in estates of various sizes and held by people called "proprietors" (this included *zemindars* as well as independent *talukdars*).[1] By no means all the proprietors were large landholders. When compensation payable was being assessed after the expropriation of rent-receiving interests, the distribution of such interests according to compensation assessed for the district of Bakerganj was found to be :

TABLE I

Compensation Due	No. of Assessees	Percentage
Rs. 200 or Less	2,011,271	88
Rs. 200-Rs. 1,000	116,058	10
Rs. 1,000 or More	21,828	2

Source : [14, p. 21].

When we come to discuss the principles on which compensation was assessed, we shall see that a compensation payment of Rs. 200 or less implies an annual income (from rent-collection as well as cultivation of own land, if any) of Rs. 20 or less. Bakerganj of course is something of a special case, where subinfeudation (of which more later) was most rampant, and therefore mini-tenure-holders may be expected to abound, [22, pp. 51-54].

The proprietors were primarily tax-collectors for the government. At the time of the Permanent Settlement (1793) Lord Cornwallis had hoped to create a class of landed aristocrats who, apart from being loyal to the crown, would

[1] An independent *talukdar* was a person to whom a *zemindar* sold his right of rent-collection over some part of his estate, the *talukdar* henceforward paying land revenue directly to the government.

also devote time and energy to good husbandary, after the manner of the "gentlemen farmers" of England. Things did not work out that way, and it must be conceded that part of the reason may have been the Crown's ambivalent attitude towards the landlords. For it is a matter of record that from the beginning of the nineteenth century, legislation after legislation was enacted which, by 1947, had left the *zemindar* a proprietor in name only. This will become clearer when we discuss the classes of *raiyats* and their rights.

Around 1950, then, most of the land in Bangladesh was under the nominal control of the *zemindars*. It appears that even the rigours of rent-collecting proved too much for them, so that they in their turn farmed out portions of their estates to independent or dependent *talukdars*. (The dependent *talukdars* paid a fixed amount to the *zemindars*, pocketing the difference between their rent-collection and this fixed due.) More frequently than not, the *talukdars* created further subordinate tenures, and so the chain went from *patni talukdars to dar-patni talukdars* to *se-patni talukdars*, etc. creating a long chain of intermediaries between the state and the *raiyat*. In Bakerganj, for example, "In 1871 only four grades of subinfeudation could be found but by 1911 this number rose to 20 and at the present day[2] this number has also been exceeded...if one proceeds to record a particular plot during the settlement operation the recorder should not be surprised if he has to open more than 50 *khatians*[3] before he can approach the man behind the plough" [22, p. 53].

Neither the proprietors nor the tenure-holders had much interest in the actual job of cultivation, which was done by the *raiyats*, and to a much smaller extent by under-*raiyats* (i.e., people who sublet land from *raiyats*).

Apart from the state, then, broadly four classes of people were connected with, and had different kinds of rights in the land. There were (i) the *zemindars*, (ii) the tenure-holders, (iii) the *raiyats*, and (iv) the under-*raiyats*. Outside this scheme of things, and marginal both economically and politically, if not numerically, were the share-croppers and the landless agricultural labourers.

In addition to the permanently settled estates, there were a sizeable number of revenue-free estates (strictly speaking, of course, these also are "permanently" settled). These appear to have been chiefly grants made by the Mughal emperors to loyal servitors and honoured by the British, though many of them were later resumed [26, Vol. II, p. 2]. In addition there were some temporarily settled private estates, where settlements were made after some amount of disaffection

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[2]1947-50.

[3]Record-of-right.

with the Permanent Settlement had set in, and some Crown (or government) estates, also called *khasmahal*. The breakdown around 1950, as reported in [19], was :

TABLE II

Category	Number	Area (million acres)
1. Permanently Settled (revenue paying)	73,157	37.37
2. Revenue Free	44,300	1.97
3. Temporarily Settled	2,387	3.34
4. Crown Estates	3,243	3.65

Source : [19, pp. 60-61, Tables 32, 33[4]].

The data on the other categories of interests are presented below:

TABLE III

Number of Tenures (in thousand)	1,702
Number of Raiyati Interests (in thousand)	9,372
Raiyati Area (thousand acres)	17,926
Under-raiyati Interests (thousands)	3,108
Under-raiyati Area	2,172
Average Size, Raiyati Interest	1.85
Average Size, Under-raiyati Interest	0.69
Rent/Acre, Raiyati Land	Rs. 3.19
Rent/Acre Under-raiyati Land	Rs. 5.68

Source : [19, Table 34] (reproduced as Appendix Table I).[5]

[4]According to the source cited, Table 31 from which the area figures are taken is from the Famine Commission Report of 1945. For the number of estates under various categories, I have used Table 32, which claims to give figures for 1950. The area in fact adds up to more than the current area of Bangladesh. This is because Bangladesh does not include all of East Bengal as previously defined. I present the figures on area, which are therefore not strictly comparable with the other figures, because they probably reflect fairly accurately the proportional division.

[5]These data claim to refer to 1950, but a comparison with [11, Vol. II, Table VI(a), pp. 107-108] reveals that only some modifications have been made for the partitioned districts. Thus the figures related to 1938-40.

The area of Bangladesh is roughly 55 thousand square miles or 35.2 million acres. The above data, however, do not include Chittagong Hill Tracts and Sylhet, for which we may deduct 6.4 million acres. Thus the total area under consideration becomes 28.8 million acres. From the above table we see that of this total, 20 million acres, or roughly 70 per cent, was operated by *raiyats* and under-*raiyats*. Even this understates the true proportion, since no allowance has been made for river area, reserve forests, and townships. Various survey and settlement reports give much higher proportions of *raiyati* and under-*raiyati* to total area. In Faridpur, in 1942/43 only 12.6 per cent of the area surveyed was under the direct occupation of proprietors and tenure-holders, (proprietors 4.3 per cent, tenure-holders 8.3 per cent), while *raiyats* and under-*raiyats* operated 85 per cent of the land [8, p. 42] (percentages have been re-calculated because of obvious error). For Dinajpur, the percentages were: proprietors 8, tenure-holders 4, *raiyats* 83, under-*raiyats* 5 [5, p. 85]. And Bell adds, "... the land held by proprietors and tenure-holders being almost entirely waste or not available for cultivation" [5, p. 85]. Of course, Bell's figures relate to 1934-40. The picture was apparently slightly different in Bakerganj, where proprietors held 6.4 per cent, but tenure-holders occupied directly as much as 20.6 per cent. The corresponding percentages for *raiyats* and under-*raiyats* were 62 and 8.3 [22, pp. 54-56].[6] Of the 6.4 per cent held by proprietors, the author says, "...most of these lands (cover) homesteads, gardens, tanks, waste lands, and burial or cremation ground. Only a small percentage is cultivated" [22, p. 54].

With some rough-and-ready methods, as suggested in [11, Vol. II, p. 111, footnote 3] we can estimate the percentage of cultivated land in each district that was directly occupied by proprietors and tenure-holders. The results are given in Appendix Table II.

This may be a good time to clarify certain matters of terminology. The number of tenures need not equal the number of tenure-holders, the number of *raiyati* interests need not equal the number of *raiyats* and the number of estates need not equal the number of "proprietors". The "interests" are essentially legal (sometimes customary) categories. The same person may hold more than one interest, and conversely more than one person may be co-sharers in the same interests. For example, we have seen that the number of permanently settled private estates was 73,157. But it appears that the number of people classified as proprietors was only 50,000.[7] Part of the difference is probably explained by the

[6]It is difficult to put any date on this information. The author says, "now" which probably refers to 1945-52—a long enough period for many changes to take place.

[7]Data supplied by Mr. Anisuzzaman, Land Reforms Commissioner.

fact that a number of estates passed to the court of Wards because their legal owners were minors. Again, from an enquiry conducted by the Floud Commission, it was found that in a sample of 19,599 families from all districts of Bengal, 37.1 per cent had only one *raiyati* or under-*raiyati* interest, while 15.2 per cent had over 5 interests [11, Vol. II, Table VIII(c)].

Of course, the *raiyats* and under-*raiyats* were not a homogenous mass. We have already seen that the under-*raiyats* were poorer, since they not only had a smaller average holding but also had to pay a higher rent per acre (Table III). The enquiry referred to above also collected data on the distribution of landholding. Since these figures are by district for all Bengal, one has to exclude areas which are now in West Bengal to obtain estimates for Bangladesh. We omitted, in addition to the district which went wholly to West Bengal, those partitioned districts of which more than half went to West Bengal.[8] The summary results are presented below:

TABLE IV

Total No. of Families	Average Holding Per Family (acres)	Percentage of Family Holding					
		Less than 2 Acres	2-4 Acres	3-4 Acres	4-5 Acres	5-10 Acres	Above 10 Acres
10,364	4.02	45.8	11.0	9.3	7.5	16.1	7.7

*Percentages do not add up to hundred because of cumulated rounding off. Appendix Table III gives district-by-district statistics. There are significant variations among districts. For example, percentage of families holding more than 10 acres ranges from a low of 0.6 in Faridpur to a high of 15 per cent in Dinajpur. Conversely, the percentage of families holding less than 2 acres is highest in Faridpur (81.5) and lowest in Dinajpur (24.2). This is hardly surprising since Faridpur has the lowest holding per family (1.63 acres) and Dinajpur the highest but one (6.38 acres).

We mentioned earlier the marginal groups in the rural economy, the share-croppers and agricultural labourers. Around 1938-40, as reported by the Floud Commission (with corrections to obtain Bangladesh figures as before) 74 per cent of the total area enquired into was cultivated by family labour, 19 per cent by *bargadars* (share-croppers) and only 7 per cent by hired labour. Again there is considerable variation among district, as Appendix Table IV shows.

Curiously enough, while the importance of wage labour is less than that of share-cropping by the above criterion, the position is reversed if we consider the way people earn their living. Apparently, of 11,314 families enquired into,

[8]In Table 35 of [19], families for Nadia district are included under Kushtia. The results are not significantly different.

12 per cent lived "mainly or entirely" as *bargadars*, while another 18.6 per cent lived "mainly or entirely" as agricultural labourers, (see Appendix Table V for details).

We can make a partial comparison of the above with some data given in the 1951 Census. There we get the following classification of the agricultural labour force (we leave aside the classifications "herdsmen and dairymen" and "other agricultural workers").

TABLE V

Status	Number	Percentage
Owning All Land Tilled	3,743,082	35.3
Owning Part & Renting Part	4,334,889	40.9
Renting All Land Tilled	621,299	5.9
Renting & Also Working for Hire	410,721	3.9
Landless Labourers	1,513,629	15.3
Total	10,623,620	

Source : [18, Table 14, p. 14-2 and p. 14-15].

If we assume, quite arbitrarily, that half the people in the fourth category may be considered to be living "mainly" as labourers or share-croppers, then it would appear that about 1.7 million out of 10.6 million may be considered to be living mainly or entirely as agricultural labourers or share-croppers. This would work out to a little less than 17 per cent, which is surprisingly low compared to 12+18.6=30.6 around 1938-40.

However, the figures are not really comparable. The question asked for indentifying the renting of land was, "Do you pay rent in cash or kind for any of the land you till" [18, p.14-1, Explanatory notes to Table 14]? Now it is almost certain that whether because of genuine confusion between produce rent and crop-share, or because of a desire to conceal one's lowly status, many share-croppers were included among the tenant-farmers. Thus one cannot conclude that the decade of the forties saw increased access to land for the underprivileged. The information one can extract from Ishaque's sample survey of 77 villages gives a much gloomier picture. Appendix Table VI gives details and sources. Here we may note that of a total of 3,213 families, as many as 961 or 29.9 per cent were either entirely landless or had just homestead land. If one adds to this

Ishaque's group B, those possessing less than one acre of land including homestead, and are heavily dependent on land they take in on a share-cropping basis, the total comes to 1,586 or just under 50 per cent. This is not too inconsistent with the findings of the Floud Commission if one assumes that all of group A and a small fraction of group B would be classified as "entirely or mainly dependent" on either agricultural labour or share-cropping, or both. Similarly if landless share-croppers have indeed been classified as tenant-farmers in the 1951 Census, this might partly account for the apparent improvement between 1945 and 1951. One cannot, of course, rule out the possibility that Ishaque's sample was a bad one.

The general picture that emerges is one of a basically peasant economy, predominantly subsistence-oriented, with a class of intermediaries whose sole economic function appears to be the collection of rent—i.e., assisting the state apparatus to transfer agricultural surplus to the centre. Some of these intermediaries were called proprietors, and some managed to make a very good thing out of it. It has been argued that in the beginning they did contribute to agricultural production by encouraging and financing reclamation of waste land, by undertaking medium-scale irrigation works etc. [11, Vol. III, pp. 123-35]. That they also had some contribution to maintaining a certain level of cultural and social decentralization is also undeniable. At least some of their incomes were spent in constructing schools, hospitals, dispensaries etc. in their areas [see partial list in 11, Vol. III, pp.343-57]. All this, of course, does not justify the essentially unearned income of this class any more (or any less) than appeals to the early pioneering and innovative role of the industrial entrepreneur, coupled with his current philanthropic activities, justifies unearned income on the private ownership of capital.[9]

How much income was accruing to this group? A definitive answer, particularly with respect to the distribution of income among them, must await fuller investigation. According to the Floud Commission Report, for the 14 districts falling wholly or mainly in Bangladesh, the difference between revenue paid and what they call "total assets"[10] works out at 59.6 million rupees. This excludes the districts of Sylhet and Chittagong Hill Tracts (Appendix Table VII). We have no way at all of estimating what this would work out to per rentier family. But for illustrative purposes, let us assume that each of the 50,000 proprietors

[9]P.T. Bauer makes the same point, though with the opposite emphasis [4, p. 209].

[10]"Total assets" is defined as the sum of "*raiyati* assets" (cash rent plus valuation of produce rents) and "estimated assets of *khas* cultivated lands of proprietors and tenure-holders". The terminology is confusing, but it is clear that flows are meant.

represents one family, while each tenure-holding family holds 2 tenures. Then we get a total of about 900,000 families. Then on an average every family gets around Rs. 64.3 per year. Quite extreme assumptions would have to be made about the number of tenures per family to yield a respectable looking income. In fact, even if we assume away the intermediate tenure-holders, ascribing the entire unearned income to proprietors, it still works out to an average annual income of Rs. 1193 per proprietor. The average land holder was therefore not opulent, even allowing for cost of living changes. Obviously there were large estates. The 443 big estates acquired at the outset of the State Acquisition operations had a total rent roll of Rs. 47.43 million [14, p.7]. Since the average rate of rent on *raiyati* land was Rs. 3.19 (Table III), we shall not go far wrong in assuming that these estates covered an area of 15 million acres over 40 per cent of the area of Bangladesh.[11] We obtain a similar impression of the size of these estates when we consider that total rent demand in the country in 1958/59 was about Rs. 95 million, so that areas covered by these estates contributed just about half the total demand [14, p.8].

To sum up this somewhat long-winded discussion, there were some very large and numerous very small proprietors, a numerous class of intermediate tenure-holders, and, at the bottom of the pyramid, the large labouring class of *raiyats* and under-*raiyats*, among whom also there was some degree of economic stratification. Among the total number of estates, about 0.36 per cent accounted for about 42 per cent of the total area of the province. The system of tenure was too complex to fall into any neat classificatory scheme, but it approximates Griffin's category 5, [20, p. 18] which he schematizes as :

Profits Salary Rent
Tenant←Intermediaries—Landlord

the arrow pointing towards the group that undertakes the risks. To bring this closer to reality we should have to interpose a group of intermediate tenure-holders between salaried intermediaries and Landlord, and also allow for the fact that the Landlord also did run the risk of having his estate put up for auction if he failed to collect enough rent to satisfy revenue demands—a very common occurence in the early days of the working of the Permanent Settlement.

One preliminary task still remains. Before we can understand what the Act of 1950 meant to the *raiyats*, we must know what in fact the *raiyat* was, what his rights and liabilities were. To this we now turn.

[11]Estates were not necessarily contiguous; on the contrary, most large estates consisted of areas in different districts.

III. CLASSES OF RAIYATS AND THEIR RIGHTS TO THE LAND

The *raiyats* fell broadly into three classes : *raiyats* at fixed rent, occupancy *raiyats*, and non-occupancy *raiyats*.[12] These categories were established and defined by the Bengal Tenancy Act of 1885—they were not of course created by the Act.

Raiyats at fixed rent were those "holding either at a rent fixed in perpetuity or at a rate of rent fixed in perpetuity" [27, p.52]. Under the Rent Acts of 1859 and 1869 the *raiyat* had to show that he or his ancestors held land at the same rent (or rate of rent) from the time of the Permanent Settlement. Under the Act of 1885, this status could also be obtained by obtaining a *mukarari* (fixed rent) lease from one's landlord [27, p.51]. Also if, during settlement operations pursuant on the Act, the settlement officer found that a certain tenant had been holding land at a fixed rent for 20 years or more, then that tenant was classified as a *raiyat* at fixed rent [27,p.52].

An occupancy *raiyat* is essentially one who has rights of occupancy—not a very revealing definition. We must discuss the rights of the different classes of *raiyats* to clarify the meanings of the categories.

Raiyats at fixed rent were, for all practical purposes, owners of their holdings. This was substantially the situation even before the Act of 1885. Later legislation codified and extended their rights--for example in the matter of trees. The interests of a *raiyat* at fixed rent were permanent, transferable, and heritable. He "could transfer his holding by sale, gift, mortgage and sub-lease in the same way as a permanent tenure-holder could" [27,p.108]. Further he could use the land as he liked. "There was nothing in the law which prevented a tenant, having permanent heritable rights at a fixed rent, from using the land in any manner he thought fit, as long as it did not impair the right of the landlord to recover the rent payable; unless there were reservations, *the landlord had no rights, other than the right to receive the stipulated rent*" [27, p.110, italics mine].

The rights of an occupancy *raiyat* were somewhat more restricted. It was heritable,"subject to any custom on the contrary; the onus would lie on the person alleging that it was not heritable" [27, p. 121]. The evolution of his right to transfer his holding (or parts there of) has been thus summed up by Kabir: ". . before and after the Permanent Settlement of 1793 the (occupancy) *raiyat* had no right of transfer. Under the Rent Acts of 1859 and 1869 an occupancy *raiyat* could not transfer his holding except without the consent of his landlord, unless the custom

[12]The exact line of demarcation between "*raiyat*" and "tenure-holder" was also hard to draw at tims. We cannot go into this here, but see Kabir [27, pp. 38-47].

of the country or the locality authorised such transfer. The Bengal Tenancy Act, 1885, had no specific provision for transfer of occupancy holdings but declared that the right to transfer, if it existed by custom, could not be taken away by any contract entered into between the landlord and the *raiyat*. By the Amending Act of 1928, however, an occupancy holding was made transferable in the same manner and to the same extent as other immovable property, subject to payment of landlord's fee and pre-emption. But the Amending Act of 1938 abolished those rights of landlords; rather it gave the right of pre-emption to a co-sharer tenant with an occupancy *raiyat*. The Act of 1928 (put only) the beneficial restriction..that he could not enter into a complete usufructuary mortgage for a period exceeding 15 years" [27, p.135]. Apart from this restriction, the holding was transferable by sale, gift, will, exchange or mortgage. By 1928 he could also "sublet his holding without any restrictions. The landlord could not take away his right to sublet by any contract" [27, p.141].

Upto the time of the Bengal Tenancy (East Bengal Amendment) Act of 1949, there were some restrictions on the use to which an occupancy *raiyat* could use his land. He could not do anything (e.g., convert agricultural land into an orchard) which would render the land unfit for the purpose for which it was let, and was liable to eviction on such ground. By the above Act, however, these restrictions were also removed, so that by 1949 there was practically no difference between *raiyats* at fixed rent and occupancy *raiyats*.

The status of non-occupancy *raiyats* was defined by custom and case law rather than legislative enactment. "A non-occupancy holding could not be transferred or bequeathed except when this was allowed by custom" [27, p.174]. He could sublet only with the permission of his landlord. He could be ejected for non-payment of rent. It should be noted that the other two classes of *raiyats* could not be ejected for non-payment of rent; their holdings could be sold in execution of a court decree for arrears. The rent of *raiyats* at fixed rent could not be enhanced. The rent of occupancy *raiyats* could be enhanced by suit or by contract. It was only the non-occupancy tenants who were completely at the mercy of "market forces" in the matter of rent. For enhancement of rent by suit, the landlord could cite one of four grounds : (a) that the rent paid by the *raiyat* is below the prevailing rate for similar land in the locality, (b) that prices of staple food-crops have risen, (c) that the land has been improved partly or wholly by some act of the landlord, and (d) that the productive power of the land has been increased by fluvial action (e.g., change in the course of a river making irrigation practicable) [27, p. 284-85]. When rent was enhanced by contract, it could be by no more than 12.5 per cent ("2 annas in the rupee"), and it could not be enhanced again for 15 years [27, p. 301].

It would appear therefore that the first two classes of *raiyats* were well-protected legally. And these classes predominated in Bangladesh. I have not been able to lay hands on data for entire province, but the three Settlement Reports cited earlier all tell the same tale. In Faridpur, for example, of the total *raiyati* area, 92 per cent was held by occupancy *raiyats* and another 5.3 per cent by area of *raiyats* fixed rent [8,p.42]. In Dinajpur, at around 1934-40, out of a total *raiyati* area 2.13 million acres, 1.81 million or 85 per cent was held by settled and occupancy *raiyats*,[13] while another 282,652 acres or 15 per cent was held by *raiyats* at fixed rent [5, p. 86, pp. 154-56]. In Bakerganj, 97.35 per cent of total *raiyati* area was held by settled *raiyats*, 0.29 per cent by *raiyats* at fixed rent, and 0.39 per cent by occupancy *raiyats*. Non-occupancy *raiyats* held 1.77 per cent of total *raiyati* area [22, p. 55]. Thus it would appear that while the most privileged class of tenants, the *raiyats* at fixed rent, were relatively few, the bulk of the *raiyats* were occupancy *raiyats*, who as we have seen, had by 1949 acquired virtually all the rights associated with ownership.

It must, however, be remembered that this was in law, and practice could and did diverge widely from the law. It was not always easy for the poor *raiyat* to set the machinery of the law in motion, or to ensure that it would not crush him rather than his powerful opponent. A Bengali proverb runs, "If you have to live in the water, you had better be on good terms with the crocodile". The *zemindars* undoubtedly got away with a great deal that was illegal. The *paiks* and *barkandazes* of the *zemindars* maintained a law and order in the villages that did not always coincide with the noble ideals of benevolent legislators. A *raiyat* could be beaten up, his standing crop distrained, and sometimes his house set on fire, and if a suit ensued, police officers as well as witnesses could be bribed or (in the case of witnesses) bullied to ensure a favourable verdict. This was all the more

[13]The distinction between "settled" and "occupancy" *raiyats* is a legalistic and subtle one, not very relevant for our purpose. According to Section 20 of the Bengal Tenancy Act, 1885, "....every person who for a period of twelve years, whether wholly or partly before or after the commencement of this Act, has continuously held as a *raiyat* land situated in any village, whether under a lease or otherwise, shall be deemed to have become, on the expiration of that period, a settled *raiyat* of that village".And Section 21 of the same conferred rights of occupancy on all settled *raiyats*. On the difference between the two, Kabir says, "An occupancy right could be acquired by purchase, but the right of a settled *raiyat* was acquired only by holding land continuously in the same village for 12 years. The mere fact that a person had an occupancy holding in a village did not give him a right of occupancy in his other holdings in the same village.. .but a settled *raiyat* obtained a right of occupancy directly he took up any fresh land. The status of a settled *raiyat* could not be transferred. This was the only distinction between a settled *raiyat* and an occupancy *raiyat*" [27, pp. 68-69] the quotation from the Bengal Tenancy Act is lifted from [27, p. 66].

probable as lawyers and judges were closely connected,by birth, marriage or purchase, with the landed aristocracy. (It is significant that almost all the Bar Associations questioned by the Floud Commission were favourable to the *zemindary* system and hostile to its abolition.) According to the Memorandum submitted by the Bengal Provincial Kisan Sabha, "... not a few peasant cultivators prefer to contract themselves into paying enhanced rents rather than go to the trouble of fighting a suit in the Courts" [11, Vol. VI, p. 32]. About Dinajpur, Bell says, "The rents in the greater number of estates have been enhanced at one time or another, in the attempt to make rent rolls expand with the rise in prices. Yet it was rare for landlords to use the direct procedure of section 30.... It is much cheaper and easier to get the tenant to agree to some enhancement. Yet no "written and registered contract" as contemplated by section 29, clause (a), was ever found. The enhancing landlord always takes regfuge in the first proviso to the section, "Provided nothing in clause (a) shall prevent a landlord from recovering rent at the rate at which it has been actually paid for a continuous period of not less than three years immediately preceding the period for which the rent is claimed". When the landlord has decided upon an enhancement, and it is clear that there will not be any serious opposition, he realizes rent at the new rate, and alters the rent in the receipt and counterfoil" [5, p.90].

In addition to such sharp practice, there were the hated *abwabs* or illegal exactions. These were sums extorted from the tenantry over and above the rent on various excuses or no excuse at all. "During the second session of the Bengal Assembly, 1937, when the Tenancy Act was under discussion the total rental of Bengal was assessed by three different speakers at 29 crores[14] (17 crores legal and 12 crores illegal), 30 crores (20 legal and 10 illegal) and 26 crores (20 legal and 6 illegal)" [11, Vol. VI, p.32]. Again, "Sometimes they are marriage fees, fines for social offences, tolls and taxes for carrying on certain trades.... Of a different kind are the levies made on the occasion of a marriage or a funeral in the landlord's house, or to pay for the purchase of a new car or horse for him.... Mukherjee reports the ironic case of a landlord who levied a tax of 2-½ times the rental in order to pay the costs of his own litligation" [11, Vol. VI, p. 34]. Bell reports that a payment of 2,3, or even 4 annas in the rupee[15] over and above the rent was quite common [5, p. 93]. He also mentions levies to buy a motor or an elephant for the *zemindar* [5, p. 94].

On balance I am inclined to the view that by 1950 the heyday of the *zemindars* was over. Partition through inheritance, increasing power of the urban professional classes as agents of British (and later Pakistani) imperial policy, and

[14] 1 Crore=10 million.

[15] 1 Rupee=16 annas.

some awakening of the "lower orders" as exemplified in the Tebhaga Movement[16] increasingly limited the arbitrary powers of the *zemindars*. The rumblings of communal discontent must also have made the Hindu *zemindars* wary of going too far in intimidating their Muslim tenants.

Already in 1940 the Floud Commission had recommended the abolition of the *zemindary* system in Bengal and its replacemtnet by a *raiyat* wari settlement, i.e., a settlement directly between the state and the cultivator [11, Vol. I, pp. 41-46]. Within three years after Partition, on February 16, 1950, the East Bengal State Acquisition and Tenancy Act was passed by the East Bengal Legislative Assembly. We turn now to a discussion of the main provision of this Act.

IV. THE ACT OF 1950—PROVISIONS AND IMPLEMENTATION

Initially, the main provisions of the Act were as follows[17] :

(1) All rent-receiving interests in all lands (agricultural and non-agricultural) are to be acquired by the government. The actual tillers of the soil will thus become direct tenants under the government. All *raiyats* (later to be called *maliks* or proprietors) will have permanent, heritable and transferable rights in their lands and will be entitled to use their land in any way they like.

(2) Subletting of land in future is strictly forbidden. Cultivation under the *barga* (crop-sharing) system is not to be treated as subletting.

(3) All *khas*[18] cultivated lands of all persons (including land cultivated through *bargadars*) in excess of 100 *bighas* (33.3 acres) per family or 10 *bighas* per member of the family, whichever is larger, plus the area of homestead land up to a maximum of 10 bighas, are to be acquired by government. This ceiling is relaxable in cases of tea, coffee, sugarcane and rubber plantations, cassia leaf gardens, orchards, and large-scale farming by the use of power-driven mechanical appliances and large-scale dairy farming.

(4) The excess *khas* land thus acquired will be settled with bonafide cultivators holding less than 3 acres of land.

(5) All *hats*[19], *bazaars*, and Fisheries (usually called Sairat Mahal) will be acquired by the government.

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[16]A share-croppers' movement for increasing their share to two-thirds instead of half the crop (1946/47). For accounts see [3, pp. 320-24 ; 33, pp. 153-59].

[17]The following is lifted more or less verbatim from [14,pp. 3-4].

[18]Land not sublet, occupied directly, also called neej, *neej-jote*, sir.

[19]*Hat* (pronounced *Haat*)—market-place which is active one or two days a week.

(6) For the acquisition of the rent-receiving interests, compensation is payable on a graduated scale ranging from 10 times the net annual income in cases of persons with net incomes of Rs. 500 or less per annum to 2 times the net annual income in case of persons with net incomes of Rs. 1 lakh (one hundred thousand) or more.

(7) For the acquisition of *khas* lands compensation is payable at the rate of 5 times the net annual profit from the land.

(8) Compensation may be paid either in cash or in bonds or both. The bonds will be non-negotiable and will be payable in not more than 40 annual instalments and will carry interest at 3 per cent.

(9) The maximum rate at which the rent of agricultural tenants can be assessed in future is limited to one-tenth of the value of the annual gross produce of the land.

(10) If not less than two-thirds of the *raiyats* of a village, holding not less than three-fourths of the total cultivated area of the village, apply for the consolidation of their holdings, the collector may consolidate all the holdings of the village.

(11) No holding can be subdivided in such a way that the rent of any portion would be less than Re. 1.

(12) After State Acquisition no one except a bonafide cultivator holding less than 100 *bighas* of land for himself and his family will be permitted to purchase or otherwise acquire new land.

Certain amendments were made to these from time to time. Some of the more important ones are listed below :

(1) The amount of retainable *khas* land was raised from 100 to 375 *bighas* by the East Pakistan Ordinance No XV of 1961. Some land had then to be restored to previous owners.

(2) Certain silly restrictions were put on transferability of holdings by Section 10 of the East Pakistan State Acquisition and Tenancy Act (Third Amendment) Ordinance, 1961 : (a) a *malik* holding 9 *bighas* or less could not transfer any portion of his land, (b) a *malik* holding more than 9 but less than 24 *bighas* could not effect any transfer which reduced the size of his holding below 9 *bighas*, and (c) anyone holding 24 *bighas* or more could not effect any transfer resulting in his holding falling below 24 *bighas*. Behind this rigmarole was some reasoning about subsistence and economic holdings. These restrictions were removed in 1964.

(3) In 1964, the exemption of the ceiling (now 375 *bighas*) was extended to cooperative societies, "provided the ownership of the land is transferred unconditionally to the society by the individual members" [27, p. 442].

Broadly it may be said that the Act had two aspects. The first was the elimination of rent-receiving interests, which would have the effect of transferring a portion of the agricultural surplus from a numerous and dispersed class of intermediaries to the provincial government. The only material benefits the cultivating *raiyat* might expect from this step would be the elimination of illegal exactions (*abwabs*), and that only in so far as the government servants whose task it would now be to collect rent did not also impose similar exactions. The *raiyats* could also benefit if the government were committed or at least inclined to spend this surplus for agricultural improvement.

The second aspect was the redistribution of land. As we shall see, the extent of redistribution was negligible. The ceiling was too high relative to the average size of holdings. It appears, in fact, that there were only 529 families having more than 375 *bighas* [12, p. 62].

The reforms were planned to proceed in two phases. In the first phase, from 1951 to 1956, big estates with good collection papers and Court-of-Wards estates were summarily taken over by the procedures set down in chapter II of the Act. In this way, as mentioned earlier, 443 estates with a total rentroll of Rs. 47,427,207 were acquired, and their excess *khas* lands vested in the government. The second phase was to have been more gradual, after through settlement operations, verification of records-of-rights, etc. But the United Front Government, which toppled the Muslim League in East Bengal in 1954, decided on more drastic steps, and instructed the Board of Revenue to prepare preliminary Rent Rolls on the basis of the existing records-of-right within 6 months. By 14 April 1956, all rent-receiving interests in all areas of East Bengal (except some parts of Bakerganj where revisional settlement was in progress) had been acquired, together with their non-retainable *khas* lands.[20] Rent-receiving interests in the excluded portions of Bakerganj were also taken over by 14 April 1958. In every case, acquisition of excess *khas* land (retainable) had to wait for the final publication of the compensation assessment rolls.

It has already been mentioned that the total number of families having more than 375 *bighas* of land was reported to be 529. According to information supplied by Mr. Anisuzzaman, Land Reforms Commissioner, this number was 439,

[20] "Non-retainable *khas* lands" refer to *hats*, *bazars*, fisheries, forests, ferries, *cutcharies* (rent-collection offices of tenureholders) and derelict tea garden. Agricultural land whether currently cultivated or not, are "retainable" [26, Vol. III, p. 77].

and the total amount of excess *khas* land was 163, 741 acres. Since net cropped area in Bangladesh was 19.2 million acres in 1947/48 [10, p. 42-43, Table 4.1] we can see that land made available for redistribution by the state Acquisition operation was infinitesimal in comparison—a little less than 1 per cent. According to the 1961 census, there were 2,547,806 landless agricultural labourers in Bangladesh [15, Table 50, p. V-109]. This number refers to all persons, male and female, over 12 years of age. Thus if all the excess *khas* land were distributed among this group only, they would receive on an average 0.06 acres per head—perhaps, assuming a family size (excluding children below 12 years) of 5[21], 0.3 acres per landless family. It must also be borne in mind that, as pointed out earlier, most of the *khas* lands of proprietors were uncultivatable, and the proprietors had choice as to which lands they would retain. The result must have been that even of the paltry total of land acquired, a large proportion would be unfit for settlement, attenuating further the redistributive effects which would be feeble in any case.

In point of fact, however, landless families were extremely unlikely to be the recipients of the land. Under Section 76 of the Act, preference was to be given to bonafide cultivating families with less than 3 acres of land. In 1957, the Revenue Department further laid down an order of priority (the 3-acre limit applies to all).

(1) Tenants of diluviated land (i.e., land washed away by a river).

(2) Ex-military men with "long and meriterious service".

(3) Any tenant not employing hired labour.

(4) Refugees.

(5) Ex-rent-receivers with no retainable *khas* land [14, p. 45].

The Land Revenue Commission 1959 suggested that share-croppers who have cultivated the same land for more than five years should be given top priority.

However, the land was not given away free. A successful applicant for *khas* land would have to pay a sum of money called *salami* to the government. A government circular dated 12th August, 1957, set the *salami* at 5 to 10 times the annual rent. On 9th August 1958, this was refixed at 50 per cent of the market value of the land. One would imagine that this implied an enhancement. In November 1962 this was further enhanced, and now the *salami* was to be the full market value of the land [12, p. 53]—in spite of the fact that the Land Revenue

[21]According to the 1960 Census of agriculture, the family sizes of holding below O.5 acres was 5—and this, of course, includes children [17, Table 47, p. 350].

Commission of 1959 had pointed out that even 50 per cent was too high for bona-fide cultivators with little land, and had recommended that it should be realized in 15 annual instalments [14, pp. 45-46]. The Land Administration Enquiry Committee of 1962 recommended that *salami* should be fixed at not more than 20 times the annual rental [12, p. 54]. None of these recommendations were accepted, and *salami* continued to be assessed at full market price until 1972. It appears that at times the Deputy Collector (Revenue) did, at his own discretion, permit payment by instalments— though certainly not as many as fifteen.[22] It cannot have been possible for many landless people to put their hands on the necessary amounts.

Available data on land settled permanently (i.e., on *raiyatwari* basis) by districts and the *salami* realized are presented in Appendix Table VIII. It should be borne in mind that the area settled and the amount realized will seldom synchronize because of the possibility of payment in instalments.

Some fragmentary evidence is available on *salami* assessed, but even here the variations are so high that one does not feel inclined to put much faith in the figures. In 1960/61, the *salami* assessed on 600 acres settled in Mymensingh was Rs. 51,920 which works out at Rs. 86.53 per acre. In the same year, 98 acres were settled in Chittagong, and the *salami* assessed was Rs. 574,519—an average of Rs. 5,862 per acre. (Of this only Rs. 81,986 or roughly 14 per cent was realized as first instalment). In Rajshahi, 280 acres were settled, the *salami* assessed being Rs. 38,388.75, or Rs. 137 per acre. *salami* realized was Rs. 3,736.61 or a little less than 10 per cent. In Rangpur, 7,710 acres were settled on an assessment of Rs. 2,919,66—about 37 paisa (Rs. 0.37) per acre [13, 1960/61, pp. 16-19].

In attempting an assessment of the distributive impact of the reforms of 1950, another point has to be kept in mind. Government *khas* land comes from various sources, excess land acquired under the Act being only one. The others are [12, p. 52] :

(1) Reformed or accreted *char*[23] lands accrued to the government by the laws of Alluvion and Diluvion.

(2) Lands purchased by the government in certificate sales (i.e., sales for arrears of revenue or rent) and

(3) Land accruing to government by surrender, abandonment, escheat, etc.

On July 1, 1962, the government held in *khas* 465, 139 acres of arable land, and 106,178 acres of waste land [12, p.53] ; I ignore the other three headings, which

[22]Personal Communication from an erstwhile settlement officer.

[23]Mud-flats thrown up by siltation in a river.

in any case add up to less than 10 per cent of the total, because obviously inconsistent criteria of classification are being used. In March 1973, "area fit for settlement" was 415,267.83 acres, and "area fit for settlement on reclamation" was 47,612.38. If we assume that these two together correspond to the classification "arable" in 1962, then we can draw up the following table :

TABLE VI

Year	Arable Land	Waste Land	Total
1962	465,139	106,178	571,317
1973	462,880	192,775	665,655

Source for 1973 : as in Appendix Table IX

We know that the total area acquired under the Act of 1950 was 163, 741[24] acres, and we have also seen that there are good reasons to assume a very high proportion of waste in this total. In 1959, under the original ceiling, total land acquired (except lands with public easement) was 234,746 acres out of which 159,537 acres or almost 68 per cent was waste. Raising the ceiling in 1961 can only have affected this percentage adversely since the landowners, who now resumed possession again, exercised choice as to which parts they would want back. Let us be optimistic and assume that 40 per cent of the land finally acquired was fit for cultivation. Then we get 65,496 acres of arable land as the contribution of the State Acquisition Act to the government's "land bank"—about 14 per cent of the total in 1973.

The conclusion seems inescapable that the redistributive impact of this Act was quite negligible. There was a redistribution, but it was not from rich landowners to poor *raiyats*. The main effect of the Act was a redistribution of income from a class of rural intermediaries to the (urban middle-class based) provincial government. To what extent this had any impact on the living conditions of the poor peasant is a moot question. Nor does it seem possible to isolate the productivity effects, if any, of the abolition of the rent receiver. In theory the impact

[24]It is a curious fact that if we add up the area acquired year by year as reported in [13], (and reproduced in Appendix Table IX) the total exceeds this figure—it comes to 171,398—and this in spite of the fact that we lack figures for the years before 1956/57, the years after 1966/67, and also for 1958/59 and 1964/65. Also, the figures reported [in 14, Statement 7, p. 80], yield a much higher figure—234,746 acres (ignoring "land having public easement"—meaning communal property like grazing grounds, graveyards, burning gats, pathways etc.) The discrepancy is probably due to the raising of the ceiling on landholding in 1961.

is likely to be nil, since the peasant is hardly likely to feel particularly motivated by the thought that he pays rent to the government rather than to an individual. Security of tenure is frequently stressed as a major precondition for peasants to undertake investments in land improvement. But as we have seen earlier, the great body of *raiyats* had security of tenure already. A commercially-minded landed class may have resorted to large-scale eviction, but no such class existed in Bengal, and evictions were rare. Sale of lands for arrears were more common, but that procedure is if anything more expeditious now, so that the tenants may well have cause to feel less rather than more secure. In the past, when a *zemindar* failed to collect enough rent to pay the revenue due to the state, it was the estate that was put up for sale.

There is also an impression that the lower government functionaries responsible for rent-collection, the *tahsildars*, are not much better than the notorious *naibs* and *gomashtas* of the former landlords. According to the Land Revenue Administration Enquiry Committee, "Everywhere we hear severe condemnation of this system. It was said that the *tahsildars are* generally corrupt and rude to the ordinary classes of tenants, that no rent can be paid in reasonable time without illegal gratification....It was further alleged that the *tahsildars* treated the Government *khas* lands as their personal property and let these out in *barga* surreptitiously for their personal gain. We were told in many places by ordinary people that the *tahsildars* are really *zemindars* in a new garb with all their oppressions and that they are all the more powerful and dangerous as they have the authority of Government behind them [12, p. 7]. And further : In the course of tours we found that the new impositions, and the multiplicity of new taxes imposed from time to time as also the exploitation of the tenants in the *tahsil* Offices have so much hurt the tenants that in many places they openly declared that they preferred the old *zemindari* system to the existing Government management" [12, p. 48]. Qadir in his study of village Dhaneshwari also found that people by and large failed to see any advantage accruing to them from the abolition of *zemindary* [12, p. 48].

The proximate economic effects of the Act of 1950 were therefore restricted to an enhancement of government revenue. (Receipts from land revenue were 17.4 million in 1947/48, 67.5 million in 1957/58, jumped to 130.5 million in 1958/59,[25] and seems to have stabilized to between 130 and 150 million in the years 1965/66 to 1969/70 : [16, p. 266-67, Table XXII]. It had, however, social and political effects which had far-reaching implications for later developments. To these we now turn.

[25]This was for 15 months—the table does not specify which months.

V. THE POLITICAL ECONOMY OF LAND LEGISLATION

To understand the social and political impact of the reforms, it is necessary that we understand its social and political background. For this, a brief digression on the Pakistan movement is called for.[26]

The Pakistan movement was initiated, organized, and led by the privileged upper stratum of the Muslims of the subcontinent. This stratum was not a class by any definition of the word : it was a loose opportunistic federation of landlords (mainly from the Punjab, the central Indian provinces, and Sind), trading communities (mainly the Memons, Bohras, and Khojas of Gujrat and Bombay), and the Muslim Westernized urban elite. The last-named group was the most developed, articulate and confident, and therefore led this coalition-a common feature of post-colonial societies, since colonial rule almost inevitably leads to the stunting of indigenous economic classes, and an abnormally high development of the professional and administrative middle class. The Muslims of Bengal were the most economically backward in the subcontinent, both relative to Muslims in other regions and to Hindus in Bengal. Their contribution to this alliance for Pakistan consisted mainly of the emergent urban professional middle-class, and populist politicians like Mr. A.K. Fazlul Huq—whose relationship with Muslim League was, however, ambivalent—to put it mildly. This middle-class naturally had close ties with the rural economy, but their origins were small to medium farmers rather than large landlords, since the overwhelming majority of the landlords were Hindus.[27] There were a few large landlord families, the chief among them being the Nawab family of Dacca, who played important roles in the Pakistan movement. But they were Bengali in mame only; in fact they disdained the name as well the language and customs of Bengal. For this reason as well as because there were so few of them, they could not be used as levers by which to move the rural masses. But the moderately affluent farmer, with a son in school or college, with more land than he can cultivate by family labour, and growing more crops than he needs for family consumption, could be approached and mobilized, and could be trusted, particularly with a little bit of help from communal tensions, to mobilize the poorer peasants also for Allah and the Muslim League. The Muslim "surplus" farmer, in fact, was already chafing

[26]The following plagiarizes shamelessly from a former article by myself [2] to which the interested reader is referred for elaboration and references.

[27]A preliminary investigation by mayself revealed that of 330 individuals whose rent-receiving interests were acquired by extraordinary Gazette Notifications during 1952 and 1953, 283 are Hindus, 44 Muslims and 3 Europeans. According to Wilbur [35, p. 219], out of 2,237 large landholders in Bengal, only 358 were Muslims. He does not, however, cite any source.

under the feudal structure of rural Society. He had tasted a little, a very little, economic power and now wanted social prestige and political leverage as well.

There is a popular impression that the "surplus" farmer did not exist among the Muslims before partition, even that he was a creation of the Ayub regime.[28] Bell's account of the *jotedars* of Dinajpur should help to dispel this misconception [5, pp. 16-17]. Particularly interesting is his citation from Buchanan Hamilton, who in 1808 estimated that one out of sixteen *raiyats* rented 30 to 100 acres of land from proprietors. For more recent times, the following table based on a sample survey of rural Bengal in 1946, is suggestive :

TABLE VII

Classes of Economic Structure	Percentage of Households			
	Caste Hindu	Muslim	Other	Total
I	5	3	2	4
II	37	44	38	42
III	58	53	60	54

Source : [30, p. 88, Table 2.1].

Mukherjee's Class I consists of landholders as well as what he calls supervisory farmers, which is "prosperous non-cultivating or supervisory farmers whose topmost position in society is unquestioned" [30, p. 10]. This is if anything a little more restrictive than our concept of the surplus farmer. Class II comprises self-sufficient cultivators as well as artisans and traders, while Class III includes labourers, share croppers, service-holders etc. Clearly Muslims are under-represented in Class I, but strangely enough they are also under-represented in Class III, and over-represented in Class II. Now it seems quite clear that if Class I were further subdivided into landlords and supervisory farmers, the Muslims would be much more under-represented in the landlord class. Most of the Caste Hindus in Class 1 would be landlords, while most of the Muslims in that class would be supervisory farmers. Since some of the Class II people might also qualify for the status of surplus farmer, it would seem a fair presumption that the percentage of Muslims who could be classified as surplus farmers would be at least as high as the equivalent percentage for Hindus. Since the large majority of them were likely to be in East Bengal, they would easily dominate rural life if it were not for the (Hindu) *zemindar* and his functionaries.

It was natural, therefore, for the Muslim League government to take quite drastic steps against the Hindu landlords. The few Muslim landed families

[28] I also fell into this error in an earlier discussion [2].

that were also affected no doubt expected adequate recompense in terms of political patronage. (It is noteworthy in this connection that West Pakistan never had such a thoroughgoing "purge" of landlords, because there the landlords were in firm control of the rural economy and of rural votes.) Most of the large landowners had, in any case, already fled the country before the Act was passed and approved. In that sense it may be questioned whether the Act accomplished much beyond recognizing and regularizing a fait *accompli.*

Thus the class nature of the Muslim League government, particularly the mediating role played by the surplus farmer, helps to explain the nature of the reforms, their curious blend of ruthlessness and wishy-washy-ness, and their divergence between regions. P.C. Joshi has also focused on this class, and its role in the formulation and implementation of reforms [25, pp. 10-13].

However, the surplus farmers were as yet too dispersed and too weak economically to be a really effective pressure-group. Quietly they slipped into the power vacuum left by the departing Hindu landlord, and took up the money-lending functions of the Hindu *banya.* Unfortunately, the epithet "dynamic" did not apply to him, at least in terms of productive or investment efforts. "He can invest his surplus money without any risk or labour by just loaning it to his neighbours who are small farmers. Each year he gets almost cent per cent return, and his principal still remains unpaid. If he saves some paddy, he can loan it from harvest to harvest and get back one and a half maunds or more for one maund. So, when this surplus farmer is told that he should use better methods, better seeds or better fertilizers for more production from his land, he is not interested" [7, p.9]

Burki has argued that the reason why agriculture was stagnant in Bangladesh during the fifties was the absence of a rural pressure group who would lobby for supply of inputs, favourable price policies etc. He thus also falls into the popular error of imagining that the surplus farmer sprang fullblown from the forehead of Field-Marshal Ayub Khan [6, Ch.6]. He is, however, right in that this group had neither the strength nor the incentive to affect government policy in this matter. The strength was acquired gradually during the fifties, and was formally recognized and sanctioned by Ayub Khan's system of Basic Democracies.

The incentive was probably provided by improving terms of trade for agriculture together with the percolation of urban consumption patterns, and was late in coming—the terms of trade started moving in favour of agriculture only in the middle sixties [24, p.364, Table I]. The developmental squeeze on agriculture fell no doubt mainly on the surplus farmers, since they were also surplus in the sense of marketing most of the marketed surplus of various products, and

they were naturally the main rural consumers of industrial goods. The Rural Works Program can best be understood as an attempt to counteract these effects of the squeeze by providing infrastructural facilities to the surplus farmer. This would explain why most of the funds went to road-building rather than flood control, irrigation or drainage (only about 10 per cent of the total Works Program expenditure went on the latter items) even though economically the latter had far higher returns [1, p.314-15].

Data on patterns of landownership are non-existent in Bangladesh. It would be hazardous to deduce anything about ownership and its changes over time from the data available on area operated. If one compares the findings of the 1960 Census with the 1967-68 Master Survey (Appendix Table X, it would seem that the movement over these years has been towards equalization of landholdings. However, this equalization is largely a matter of more and more holdings getting concentrated in the less than 2.5 acres category, with a moderate increase in the share of land operated going to them. For this group total number of holdings went up 22.7 per cent, from 3.17 million to 3.89 million; the area operated by them went up by 30.1 per cent, from 3.53 million acres to 4.60 million acres, resulting in a rise in average holding size from 1.11 acres to 1.18 acres. However, it is interesting to note that holdings between 5 to 25 acres were getting fewer and also very slightly smaller, while the holdings above 25 acres increased quite spectacularly, by 16 per cent, while area operated by them dropped by 7.6 per cent. This drop is mainly due to a drastic drop in the area operated in holdings of over 40 acres. All this probably reflects some sort of rationalization of production under conditions of capital shortage, for clearly a forty-acre holding is uneconomical in the absence of capitalistic farming and mechanization.

Another interesting aspect of the change between these two dates relates to the percentage of owner-operated to tenant-operated land by size of operational holdings.

TABLE VIII

Size Class (acres)	Percentage of Owner-operated to Total Operated Land	
	1960	1967/68
Less than 0.5	93	88.41
0.5 to less than 1.0	88	88.60
1.0 to less than 2.5	81	80.79
2.5 to less than 5.0	77	79.02
5.0 to less than 7.5	79	80.67
7.5 to less than 12.5	84	84.61
12.5 to less than 25.0	88	83.34
25.0 to less tha ı 40.0	92	79.53
40.0 and more	93	84.27
Overall	82	81.38

Source : [17, Table 9, p. 75 ; 9, Table 3, p.13].

While the percentage of land that is owner-operated overall has hardly changed, we note that the percentage has dropped quite a bit for the lowest size-class as well as the two highest size classes. On the one hand this corroborates our suspicion that the rise in area operated by the small farmers did not reflect changes in ownership. On the other hand, and this is harder to understand, it appears that the larger holdings are more likely to be tenancies than before.[29]

The rise of the surplus farmer to eminence in local politics is vividly brought out in the following table from Rashiduzzaman [32, p. 41], showing the distribution of Union Council Chairmen by annual income.

TABLE IX

No. of Chairman	Income Range				
	Below Rs. 1000	1000-1999	2000-2999	3000-3999	Above 4000
84 Elected in 1961	76.9	12.2	7.3	1.2	2.4
3,675 Elected in 1965	2.18	7.51	14.28	14.91	61.12

Admittedly the first sample is very small, and sampling errors are likely to be large. Yet the dramatic reversal of percentages can hardly be explained away on that basis. Not only the Chairmen of the Union Councils but also the members, are likely to be from the relatively affluent strata of rural society. Out of 392 Union Councillors elected in 1961, it was found that 42.40 per cent held 12.5 or more acres of land, while only 2.29 per cent held less than 2.5 acres [32, p.43].

In a manner of speaking, history had come full circle with the Act of 1950. In 1793 Lord Cornwallis, actuated primarily by a desire for stable land revenue,

[29]The 1960 Census of Agriculture defines a tenant farmer as one who operates land owned by others. Since there is also an owner—cum—tenant classification, it would follow that the tenant farmer either has no land of his own, or has rented all his land out to other tenants. Between 1960 and 1967/68 it would appear that tenant farmers operating 7.5 acres or more grew both in numbers and it terms of land held:

Year	No. of Tenant Farmers	Area Operated	Average Size
1960	2,990	32,319	10.81
1967/68	18,550	245,820	13.25

Source : [17, Table 5, p. 46 ; 9, Table 2 (a), p.11].

It is not easy to understand this rather spectacular development. One explanation might be a sort of *defacto* consolidation, whereby a person owning several scattered plots of land lets them out to small or landless farmers, and himself rents one large contiguous plot from a large landowner. A certain amount of "capitalist farming" might be involved, though evidence is lacking.

settled with *talukdars* and tax-collectors under the established landed families of Bengal, thus cutting off the latter from their source of livelihood and prestige, it so happens that many of these families were Muslims [29, pp.129-35]. In 1950, the Government of East Pakistan, actuated partly by the need to increase revenue and partly by political considerations, served the (mainly Hindu) landed classes in the same fashion. Neither in the first nor in the second case were the results particularly beneficial to the rural poor. Each benefited an intermediate class which failed to perform any dynamic productive mission.

As to why the surplus farmer failed to become a dynamic capitalist farmer, this is an extremely complex question whose answer, to be anywhere near adequate, must draw on many different disciplines—and is even then, in the very nature of things, likely to remain conjectural. Lack of the incentives provided by an expanding market, whether external or internal, the risks of unmechanized monsoon agriculture which made money-lending and petty landlordism more attractive, the bias of government policy towards industrialization, and paradoxically, the failure of this policy at least as far as East Pakistan was concerned—all no doubt played their part. The "reforms" as such probably had very little to do with it one way or another, except in the purely hopothetical sense that a powerful landed upper class, if it had existed or been deliberately created (for example by expropriating the Hindu landlords and settling their estates, by sale or otherwise, on the relatively affluent Muslim farmers) would have created a different set of pressures on the government, and would perhaps have led to an accelerated formation of a middle-class mediating between town and countryside. Obviously such a step could never have been contemplated.

VI. LAND LEGISLATION AFTER LIBERATION

The most significant development in this field were the two Presidential Orders, P.O. 96 and P.O. 98,[30] promulgated on 14th and 15th August, 1972. The first exempted all agricultural families owning 25 *bighas* or less of agricultural land from payment of land revenue. They would, however, still be liable to pay the various cesses and rates, e.g., the Development and Relief Tax, the Education Cess, the Local Rate etc. Under Article 151D of this Order, "all heads of families, who either individually or with other members of their families held or hold more than twenty-five standard *bighas*[31] of agricultural lands in Bangladesh on the

[30]P.O. 96 is called "The State Acquisition and Tenancy (Third Amendment) Order 1972", and P.O. 98 "The Bangladesh Landholdings (Limitation) Order, 1972". These were published in the Bangladesh Gazette, Extraordinary, Part III A, August 15, 1972.

[31]The *bigha* used to vary a great deal from district to district. The standard *bigha* is defined as 0.33 acres.

16th day of December, 1971, or on the date of submission of the statement, shall submit to the Revenue Officer a statement of all such lands in such form and manner as may be prescribed". Failure to abide by this injunction is punishable by a maximum fine of Taka 1000, and excess land which has been concealed will be confiscated.

P.O. 98 reduced the ceiling on retainable *khas* land to 100 *bighas*. A new round of state acquisition of excess lands is therefore starting. By Article 7 heads of families holding more than 100 *bighas* of land are directed to submit a statement of excess lands within ninety days of the date of commencement of the order (i.e., within 90 days of 15 August 1972). Failure to comply is punishable by imprisonment for upto a term of six months, or by a fine upto Taka ten thousand, or both. By Article 13, compensation will be payable for excess land acquired by the government at the rate of twenty per cent of the market value of the land for the first fifty *bighas*, and ten per cent of the market value for quantities over fifty *bighas*. As before, families can exercise choice as to which lands they want to give up.

Some data have therefore become available on (i) number of families holding more than 25 *bighas* of agricultural land and the amount of excess land according to these returns, and (ii) number of families having more 100 *bighas* of land and the amount of excess land to these returns. These data are presented in Appendix Table 14. So far, only 5,371 families have filed returns showing excess lands, and total area of excess land declared is 76,712 acres. The distributional impact of this measure is again not likely to be very significant.

In the matter of settlement of *khas* land, the following decisions have been taken.[32]

(i) The lands would be settled with bonafide agricultural families having no land or less than 1.5 acres of land, according to certain priorities.

(ii) Except in cases of cultivation on co-operative basis, the total quantity of land to be settled with a family would be such that the total land owned by the family should not exceed 1.5 acres after settlement. (e.g., a family having 0.5 acres of land would be entitled to receive no more than 1 acre of land).

(iii) Settlement will be free of *salami* and rent but subject to the payment of the allied dues that used to be realized along with rent.

[32]For the following, I have drawn on an unpublished lecture given as part of a Training course at the Directorate of Land Records and Surveys, prepared by Mr. M.H. Mullick and made available to me by Mr. Mahmood, Deputy DLR.

(iv) When compact blocks of more than 50 acres of land are available, settlement will be made on condition that the settlement holders will form cooperative societies. In such cases, each family settled will be entitled to an extra acre of land on payment of a *salami* of half the market value, payable in not more than ten annual instalments.

(v) Where compact blocks of 500 acres or more are available, attempts will be made to establish clustered villages in such blocks for cultivation of the blocks on cooperative basis.

Undoubtedly all this represents an important advance over the pre-existing situation. Particularly laudable is the abolition of *salami*, which will expedite the settlement of *khas* lands. The exemption of landholdings below 25 *bighas* from land revenue will certainly make millions of people a little happier. However, this is going to eliminate land revenue as a major source of government receipts. At the same time, since the rates and cesses have to be collected, the question of dismantling the costly collection apparatus does not arise, in fact even any significant contraction is unlikely. Since costs of collection of land revenue have been variously estimated to be between 20 per cent to 77 per cent [13, various issues]; [10, Table 13-14, p. 23], while miscellaneous rates and cesses were usually 30 or 35 per cent of land revenue, this department is bound to become a dead weight, costing more than it yields. Strictly from the point of view of revenue administration, it would have made more sense to abolish all rates and cesses as well.

On the other hand, whether this particular measure is likely to encourage production and sale or discourage them is debatable. The supply curve of effort might well be backward—bending for the majority of farmers in this category. The old problem of how to squeeze the peasantry is very much with us to-day. The trick is to find a way of squeezing in a suitably propitiatory manner. Perhaps the virtual abolition of the land revenue is a step in this direction, since price movements are usually harder to blame on the government.

VII. RECAPITULATION AND THOUGHTS ON FEASIBLE FUTURES

In 1950, the East Bengal State Acquisition and Tenancy Act abolished the Permanent Settlement, and brought the cultivating tenants directly under the State. All rights in land between the cultivator and the State were abolished. Over three million rent-receiving interests were extinguished, which included 50,000 proprietors. A half-hearted attempt at ceiling legislation was made, the ceiling on total land-holding being set initially at 100 *bighas* (33.3 acres) and in 1961, under Ayub Khan, raised to 375 *bighas* (approximately 125 acres). The amount of excess land thus made available for redistribution was 163,741 acres—an insignificant frac-

tion of the total net cropped area of around 20 million acres. If one uses figures for landless labourers from the 1961 Census, this would provide about 0.07 acres of land to each landless labourer if it were all in fact alloted to them. As a matter of fact high rates of *salami* made it unlikely that the landless would get any of this land. Also, because large landowners usually retained as their own land only land unfit for cultivation, renting out all the land they could, the excess land acquired was mostly waste. Even a generous calculation would suggest that at most 40 per cent of the land so acquired was fit for cultivation. Thus the redistributive impact of the Act was negligible, and by Doreen Warriner's criterion it cannot be called a reform at all. It could at best be called an attempted reform of revenue administration. As such, it was moderately successful, enabling the government to centralize agricultural surplus into its own hands. The welfare of the rural poor was affected marginally, if at all. It purported to eliminate a parasitic class, but whether the class that replaced it was less parasitic is debatable.

Lands available for settlement come from various sources, e.g., land formed by siltation of rivers, land resumed for non-payment of rent, land reverting to the state by surrender, abandonment or escheat, etc. In mid-1973, the total amount of such lands was 728,468.35 acres,of which 415,267.83 acres were fit for settlement, another 47,612.38 acres were fit for settlement on reclamation, and 192,774.88 acres were uncultivable waste. (This includes the excess lands of ex-rent-receivers acquired under the Act of 1950 as well as land acquired by P.O. 98).

According to some incomplete data, total area settled with cultivators from 1956/57 to 1972/73 was 331,267 acres, for which a total amount of Rs. 6,616,871 were realized as *salami.* It must be realized that in so far as the land settled came chiefly from sources other than the acquired excess lands, the process of settlement need not imply a redistribution.

It has been argued that the nature of the "reform" and its mode of implementation can only be understood with reference to the class nature of the Pakistan movement.

Post-liberation enactments have been in the right directions,but again the overall impact is not likely to be very significant in terms of either efficiency or equity. The main provisions, under Presidential Orders 96 and 98, are (i) families holding 25 *bighas* (about 8.25 acres) or less are exempted from payment of land revenue, and (ii) the maximum amount of land retainable by a family has been refixed at the original ceiling of 100 *bighas.* It is currently estimated that this will release 76,712 acres of land for redistribution. Since the system of realizing *salami* has been abolished, settlement may be more expeditions than before.

It is frequently suggested that in Bangladesh (or indeed in any poor country) a drastic land redistribution would promote both growth and equity. Available evidence does indicate that in Bangladesh, as in most poor countries, the smaller farmers for Bangladesh particularly farmers operating between 2.5 and 5 acres—are more "efficient" than larger ones—i.e., they (1) have a higher yield per acre, (2) have a higher percentage of their area under more profitable cash crops, and (3) use more labour per acre and per unit of output. (For Bangladesh see [9; 17; 21; 28]. The last is an advantage because employment creation in agriculture is a desideratum.

However, as it stands the argument is suspect. Basically it recommends completely eliminating the possibility of a development of agriculture along capitalist lines without at the same time laying the basis for a socialist transformation of agriculture. A regime of small peasant proprietors will be less propitions for accumulation and growth, less organically integrated with the market, than even the existing petty commodity producing, semi-feudal structure; which at least contains the germs of capitalism. This argument ignores the fact that the behaviour of a production unit depends not only (not even mainly) or its size, but on its place in the total structure. It is foolish to expect, for example, that small farmers will continue to grow as much cash crops as they now do when there are no longer any large farmers disposing of large surpluses of rice.

The urgency of such a sweeping reform lies, not in essentially static efficiency considerations, but in its role as a(possibly indispensible) stage in the move toward organizing agriculture on a socialist basis—which essentially means replacing decision-making at the farm level by decision-making at the level of an appropriately defined collective unit. Clearly such a programme can be worked out and implemented only through political action. Trying to recommend this as a policy is a pointless exercise. One can at best try to estimate the probabilities of such a development.

The other path—and it is my view that Bangladesh will be travelling this path at least for a few years—is essentially that of fostering capitalism through cooperatives and associated measures, as under the IRDP. This will not alleviate inequalities, but it may, if efficiently administered, foster growth and weaken the last vestiges of semi-feudalism from our agriculture. That would be no mean contribution, and in this sense the IRDP or similar programmes have a progressive content. Of course, whether such a programme will in fact be efficiently administered depends not simply on accident or skill shortages, but also on the class basis of the regime in power.

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Appendix

TABLE I

NUMBER OF ESTATES, TENURES, RAIYAT AND UNDER-RAIYAT INTERESTS, ETC. IN EAST BENGAL, 1938/39

District	Number of Estates			Raiyat Interest				Under-raiyat Interest			
	Revenue Paying Including Temporarily Settled Private and Khas Mahal	Revenue Free	No. of Tenures Thousand	No. (in thousand)	Area in Khas (in thousand acres)	Average Area Per Interes t	Incidence of Cash Rent Per Acre	Number (in thousand)	Area (in khas in thousand acres)	Average Area Per Interest	Incidence of Cash Rent Per Acre
Dacca	11,923	5,366	98	916	1,422	1.55	2.81	34	19	0.55	5.44
Mymensingh	10,796	1,627	140	1,127	2,892	2.56	2.87	113	124	1.09	4.69
Bakerganj	4,219	50	426	570	1,311	2.30	4.50	79	82	1.03	7.25
Faridpur	6,495	169	222	840	1,164	1.38	2.56	240	133	0.55	3.81
Rajshahi	2,300	192	53	897	1,751	1.95	3.00	317	181	0.57	5.87
Dinajpur	713	185	37	457	1,090	2.38	2.44	111	79	0.71	5.25
Rangpur	815	466	66	803	1,387	1.72	3.00	597	538	0.90	6.75
Pabna	2,199	62	33	418	923	2.20	3.06	63	40	0.63	5.62
Bogra	697	41	28	318	727	2.28	2.87	86	65	0.75	8.31
Khulna	1,254	66	123	427	980	2.29	3.37	273	220	0.80	5.25
Kushtia	1,208	170	47	335	598	1.78	2.44	165	86	0.52	4.50
Jessore	2,518	212	166	798	976	1.22	2.50	802	445	0.55	3.87
Chittagong	28,392	35,122	140	691	497	0.71	4.69	145	69	0.47	5.37
Noakhali	1,728	292	36	196	430	2.19	4.25	42	45	1.07	6.62
Tippera	3,725	280	87	579	1,278	2.20	3.12	39	46	1.17	6.69
Sylhet, Chittagong Hill Tracts	Figures not available										
Total	78,982	44,300	1,702	9,372	17,926		3,108	2,172			

Source : [19, p. 63, Table 34].

TABLE II

PERCENTAGE OF CULTIVATED LAND UNDER DIRECT OCCUPATION OF PROPRIETORS AND TENURE-HOLDERS, 1938/39

Districts (1)	Raiyati Area in Thousand Acres (2)	Net Cultivated Area in Thousand Acres (3)	$\frac{\text{Col. } 2}{\text{Col. } 3} \times 0.8$ (4)	1 — Col. 4 (5)
Bakerganj	1,311	1,553	.675	.325
Bogra	727	723	.804	.196
Chittagong	497	632	.629	.371
Dacca	1,422	1,305	.872	.128
Dinajpur	1,853	1,923	.771	.229
Faridpur	1,164	1,197	.778	.222
Jessore	1,084	1,410	615	.385
Khulna	980	1,115	.703	.297
Mymensingh	2,892	2,661	.869	.131
Noakhali	430	720	.478	.522
Pabna	923	835	.884	.116
Rajshahi	1,236	1,249	7.92	.208
Rangpur	1,362	1,611	.676	.324
Tippera	1,278	1,304	.784	.216

Source : [11, Vol. 2, Tables VI (a), VIII (a)].

Note : Total *raiyati* area was multiplied by 0.8 to obtain net cultivated area under *raiyati* occupation. This was deducted from net cultivated area of the district to get cultivated area under direct occupation of proprietors and tenure-holders.

TABLE III

DISTRIBUTION OF FAMILIES BY SIZE OF LAND HOLDING, 1938/39

Districts	No.of Families Enquired Into	Total Area Held by Them	Average Area Per Family in Acres	Percentage of Familiies With					
				Less Than 2 Acres	2—3 Acres	3—4 Acres	4—5 Acres	5—10 Acres	Above 10 Acres
1	2	3	4	5(a)	5(b)	5(c)	5(d)	5(e)	5(f)
Bakerganj	804	1752.66	2.17	61.8	13.1	9.1	3.9	10.9	1.2
Bogra	464	1984.45	4.28	34.5	14.2	13.6	12.7	17.9	7.1
Chittagong	690	1693.95	2.45	60.3	10.1	8.8	5.8	10.7	4.3
Dacca	508	1082.27	2.13	62.4	11.6	6.1	6.1	5.1	3.5
Dinajpur	1020	6512.22	6.38	24.2	8.9	11.1	10.2	28.3	15.0
Faridpur	1104	1796.54	1.63	81.5	7.6	3.4	1.8	2.6	0.6
Jessore	1073	5133.74	4.78	28.5	10.3	9.6	9.8	27.1	13.6
Khulna	356	1701.68	4.78	55.6	7.8	9.0	6.1	13.9	7.6
Mymenshingh	931	3597.55	3.86	34.1	13.9	11.9	10.5	16.9	6.5
Noakhali	502	1208.43	2.41	65.3	12.1	7.8	3.4	4.2	2.8
Pabna	701	1673.28	2.39	64.1	9.2	5.8	4.1	7.1	2.4
Rajshahi	1018	5617.84	5.52	31.8	9.3	9.7	9.1	25.5	14.6
Rangpur	1193	7964.30	6.67	24.6	15.3	13.4	10.6	21.4	11.2
Tippera	950	2112.91	2.22	63.9	13.7	8.6	4.3	6.6	2.9
Total	**11,314**	**43,831.82**		**45.85**	**11.04**	**9.29**	**7.47**	**16.12**	**7.68**

Source: [11,Vol.2, Table VIII (b), p. 115].

TABLE IV

THE MANNER IN WHICH LANDS ARE CULTIVATED, 1938/39

Districts	Total cultivated Area Enquired Into	Cultivated					
		By Family Member		By Bargadars		By Labourers	
		Area	Percentage	Area	Percentage	Area	Percentage
Bakerganj	1230.83	681.21	55.3	549.62	44.7		
Bogra	1696.07	1371.05	80.8	270.54	16.0	54.48	3.2
Chittagong	1599.80	1248.94	78.1	191.17	11.9	159.69	10.0
Dacca	921.00	560.65	60.9	211.36	22.9	148.99	16.2
Dinajpur	5208.52	3748.04	72.0	754.18	14·5	706.30	13.6
Faridpur	1516.55	1220.28	80.5	172.89	11.4	123.38	8.1
Jessore	4085.33	2914.58	71.3	901.56	22.1	269.19	6.6
Khulna	819.48	391.12	47.7	411.08	50.2	17.28	2.1
Mymensingh	3083.08	2411.57	78.2	317.85	10.3	353.66	11.5
Noakhali	948.44	668.98	70.5	158.96	16.8	120.50	12.7
Pabna	1393.18	1080.51	77.6	270.50	19.4	42.17	3.0
Rajshahi	4507.26	3653.05	81.0	676.91	15.0	177.30	3.9
Rangpur	5558.15	4010.23	72.2	1265.02	22.8	282.90	5.1
Tippera	1680.70	1185.87	70.6	208.66	12.4	286.17	17.0
Total	34248.39	25146.08	73.42	6360.30	18.57	2742.01	8.01

Source : [11, Vol. II, Table VIII (e), p. 118-19].

TABLE V

THE MANNER IN WHICH LANDS ARE CULTIVATED

Districts	No. of Families Enquired Into	Living Mainly or Entirely as Bargadars		Living Mainly or Entirely on Agricultural Wages	
		Number	Percentage	Number	Percentage
Bakerganj	804	57	7.1	190	23.6
Bogra	464	62	13.4	119	25.6
Chittagong	690	12	1.8	80	11.6
Dacca	508	35	6.9	113	22.2
Dinajpur	1020	141	13.8	230	23.5
Faridpur	1104	263	23.8	173	15.7
Jessore	1073	45	4.2	85	7.9
Khulna	356	47	13.2	149	41.9
Mymensingh	931	67	7.3	187	20.0
Noakhali	502	11	2.2	90	17.9
Pabna	701	183	26.1	107	15.2
Rajshahi	1018	133	13.0	243	23.8
Rangpur	1193	228	19.1	154	12.9
Tippera	950	10	1.1	46	4.8
Total	11314	1294	12.39	1966	18.59

Source : [11, Vol. II, Table VIII (d), p. 117].

TABLE VI

THE MANNER IN WHICH LANDS ARE CULTIVATED, BY OWNERSHIP SIZE GROUPS, 1944/45

Classification of Families	No. of Families in Each Class	Khas or Nijdakhal Lands under Cultivation by Self or by Labourers	Khas or Nijdakhal Lands Other than Cultivated Lands, e.g., Home-stead Tanks or Chards etc. (acres)	Khas or Nijdakhal Lands Let out to Bargadars (acres)	Khas or Nijdakhal Lands Mortgaged to others under Usufructuary (acres)	Total of 3, 4, 5 and 6 (acres)	Lands Leased out to Tenants (acres)	Lands Cultivated at Bargadars or Adhairs Whether by Self or Labourers (acres)	Lands Held under Temporary Lease other than Barga (acres)	Lands Held under Usufructuary Mortgage Cultivated by Self or by Labourers (acres)	Total of 9, 10 and 11 (acres)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
A	961		137.54			137.54		363.14	6.75	3.13	373.02
B	625	182.19	134.98	61.30	21.30	399.77	13.21	256.74	24.15	9.10	289.99
C	806	1034.07	311.93	189.24	65.07	1600.31	41.82	405.79	23.53	24.23	453.55
D	331	886.57	167.15	203.35	35.97	1293.04	50.14	176.49	16.25	18.51	211.25
E	490	2850.18	658.03	1644.73	63.87	5216.81	6329.39	167.67	14.62	23.04	205.33
Total	3213	4953.01	1409.63	2098.62	186.21	8647.47	6434.56	1369.83	85.30	78.01	1533.14

Source : [23, Table IX (a), p. 122-33].

Note : Classification of families :

(A) Landless families or families having no khas land of their own other than homestead lands.

(B) Families having in addition to homestead lands, some *khas* lands also, the grand total of the area not exceeding 1 acre.

(C) As (B) above, the total area not exceeding 3 acres.

(D) As (B) above, the total area not exceeding 5 acres, and

(E) As (B) above, the total area exceeding 5 acres.

TABLE VII

STATEMENT OF REVENUE AND ASSETS

Districts	Revenue (in lakhs)	Raiyati Assets (cash rent plus valuation of produce rent) (in lakhs)	Estimated Assets of Khas Cultivated Land of Proprietors and Tennure-holders (in lakhs)	Total Assets (in lakhs)
(1)	(2)	(3)	(4)	(5)
Bakerganj	30.08	70.09	19.75	89.84
Bogra	4.93	24.46	2.55	27.01
Chittagong	15.44	26.68	8.39	35.07
Dacca	6.65	48.42	4.27	52.69
Dinajpur	15.34	48.15	8.36	56.51
Faridpur	7.62	47.52	4.07	51.59
Jessore	8.96	39.28	3.70	42.98
Khulna	9.23	46.65	5.23	51.88
Mymensingh	9.30	94.59	7.13	101.72
Noakhali	12.33	27.19	14.45	41.64
Pabna	5.29	32.01	1.99	34.00
Rajshahi	10.28	51.19	3.88	55.07
Rangpur	10.25	59.85	2.79	62.64
Tippera	11.98	42.20	7.65	49.85
Total	157.68	658.28	94.21	752.49

Source : [11, Vol, 11, p. 111].

TABLE VIII

LAND SETTLED RAIYATWARI AND SALAMI REALISED, 1956/57 TO 1972/73

Districts	*1957/58	1959/60			1960/61			1961/62		
	Land Settled	Land Settled	Salami Paid	Salami Per Acre	Land Settled	Salami Paid	Salami Per Acre	Land Settled	Salami Paid	Salami Per Acre
Dacca	n.a.	n.a.	12,812.00	n.a.	n.a.	45,733.00	n.a.	5,860.06	54,413.00	9.29
Mymensingh	n.a.	2,785.84	n.a.	n.a.	4,640.11	n.a.	n.a.	n.a.	n.a.	n.a.
Faridpur	n.a	3,462.22	24,791.00	7.16	4,155.27	94,867.00	22.83	1,579.44	250,811.00	158.80
Khulna	n.a.	n.a.	n.a.	n.a.	341.43	110,208.00	322.78	1,617.63	60,024.00	37.11
Jessore	n.a.	2,852.98	n.a.	n.a.	921.29	4,976.00	5.40	672.29	29,711.00	44.19
Kushtia	654.42	2,641.79	n.a.	n.a.	943.49	84,933.00	90.02	1,267.62	n.a.	n.a.
Bakerganj	n.a.	48,903.00	1,310,354.00	26.79	3,830.00	473,587.00	123.65	14,743.00	59,421.00	4.03
Rajshahi	n.a.	307.58	n.a.	n.a.	280.00	n.a.	n.a.	108.00	n.a.	n.a.
Dinajpur	n.a.	3,332.87	n.a.	n.a.	493.10	65,730.00	133.30	8,457.87	67,427.00	7.97
Rangpur	n.a.	417.53	n.a.	n.a.	7,710.00	n.a.	n.a.	3,136.00	713,720.00	227.59
Pabna	n.a.	384.85	n.a.	n.a.	686.13	116,534.00	169.84	959.52	61,725.00	64.33
Bogra	n.a.	2,000.00	n.a.	n..a.	683.00	78,102.04	114.35	1,694.47	109,676.00	64.73
Chittagong	5,964.64	1,151.72	n.a.	n.a.	98.00	81,986.00	836.59	188.74	53,136.00	281.53
Comilla	n.a.	68.43	n.a.	n.a.	501.76	n.a.	n.a.	161.87	3,556.00	21.97
Sylhet	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Noakhali	1,303.00	19,138.41	n.a.	n.a.	7,537.11	n.a.	n.a.	162.00	67,281.00	415.31
Total	7,922.06	87,447.22	1,347,957.00	15.41	32,820.69	1,156,656.00	35.24	40,608.51	1,530,901.00	37.70

(*contd.*)

TABLE VIII (*contd.*)

Districts	1962/63			*1963/64	1965/66			1966/67			*1972/73
	Land Settled	Salami Paid	Salami Per Acre	Land Settled	Land Settled	Salami Paid	Salami Per Acre	Land Settled	Salami Paid	Salami Per Acre	Land Settled
Dacca	n.a.	8,292	n.a.	88.67	464.70	13,364.00	28.76	434.76	39,024.00	89.76	n.a.
Mymensingh	n.a.	n.a.	n.a.	62.42	1,978.73	n.a.	n.a.	7,558.92	n.a.	n.a.	2,023.00
Faridpur	526.40	113,292.00	215.22	943.11	1,335.00	259,35200	194.27	4,806.00	n.a.	n.a.	607.00
Khulna	1,186.00	29,440.00	24.82	321.32	1,556.90	125,11500	80.36	1,644.53	n.a.	n.a.	652.00
Jessore	108.00	34,424.00	318.74	35.00	n.a.	27,289.00	n.a.	n.a.	55,647.00	n.a.	800.00
Kushtia	1,092.51	n.a.	n.a.	3,010.00	1,046.41	n.a.	n.a.	355.99	n.a.	n.a.	88.00
Bakerganj	n.a.	103,187.00	n.a.	2,204.00	6,008.00	n.a.	n.a.	37,395.00	n.a.	n.a.	6,696.00
Rajshahi	205.60	n.a.	n.a.	218.85	n.a.	293,767.00	n.a.	7,169.87	n.a.	n.a.	3,587.00
Dinajpur	2,401.42	25,564.00	10.65	2,354.94	1,135.22	n.a.	n.a.	561.98	n.a.	n.a.	n.a.
Rangpur	565.45	141,493.00	250.23	643.42	1,721.44	319,881.00	185.82	2,286.68	n.a.	n.a.	14,346.00
Pabna	533.77	18,205.00	34.11	139.82	931.34	90,722.00	97.41	1,012.76	n.a.	n.a.	249.00
Bogra	64.62	46.00	0.71	9.56	552.33	25,718.00	46.56	761.62	n.a.	n.a.	71.00
Chittagong	672.00	39,180.00	58.30	635.49	621.67	397,765.00	639.83	1,407.94	112,238.00	79.72	1,620.00
Comilla	493.51	1,999.00	4.05	86.57	309.51	n.a.	n.a.	72.90	n.a.	n.a.	455.00
Sylhet	n.a.	n.a.	n.a.	n.a.	4,563.10	53,754.00	11.78	6,750.00	102,796.00	15.23	320.00
Noakhali	17.31	149,803.00	8,654.13	9.57	2,773.00	n.a.	n.a.	13,109.00	n.a.	n.a.	2,000.00
Total	7,866.59	664,925.00	84.52	10,762.74	24,997.35	1,606,727.00	64.28	85,327.95	309,705.00	3.62	33,514.00

(*contd.*)

TABLE VIII (*contd.*)

Districts	Total Land Settled	Total Salami Paid
Dacca	6,848.19	173,638.00
Mymensingh	19,049.02	n.a.
Faridpur	17,414.44	743,113.00
Khulna	7,319.81	324,787.00
Jessore	5,389.56	152,047.00
Kushtia	11,100.23	84,933.00
Bakerganj	119.779.00	1,946,549.00
Rajshahi	11,876.90	293,767.00
Dinajpur	18,737.40	158,721.00
Rangpur	30,826.52	1,175,094.00
Pabna	4,897.19	287,186.00
Bogra	5,836.60	213,542.04
Chittagong	12,360.20	684,305.00
Comilla	2,149.55	5,555.00
Sylhet	11,633.10	156,550.00
Noakhali	46,049.40	217,084.00
Total	331,267.11	6,616,871.04

* =Relevant data for 'Salami Paid' for these years were not available.

n.a.=Not available.

In 1972/73, in addition, 2,000 acres of agricultural ***khas*** land has been settled with 800 families for the establishment of 4 clustered village each with 200 families in Sudharam P.S. of Noakhali . A development scheme for the establishment of six such clustered villages including those four has been set up and will be submitted to the Planning Commission very soon.

Source : Various issues of Report on the Land Revenue Administration of East Pakistan.

TABLE IX

AVAILABLE KHAS LAND BY DISTRICTS AND BY TYPE OF LAND, 1973

Districts	Area Fit for Settlement (acres)	Area Fit for Settlement on Reclamation (acres)	Uncultivable Naste (acres)	Non-agricultural (arces)
(1)	(2)	(3)	(4)	(5)
Dinajpur	15,934.39	1,943.12	2,159.07	4,031.49
Rangpur	50,044.86	1,403.28	37,907.07	4,164.67
Bogra	2,054.70	50.95	3,192.35	1,029.92
Rajshahi	9,104.45	986.24	2,000.15	2,400.86
Pabna	5,593.00	872.00	3,566.00	809.00
Kushtia	2,960.73	58.99	1,317.13	160.39
Jessore	6,667.12	721.31	1,459.53	2,123.45
Bakerganj	15,981.89	228.43	4,511.12	262.48
Khulna	11,591.99	693.90	3,064.52	708.85
Patuakhali	21,750.12	416.37	1,662.42	332.30
Faridpur	23,164.00	1,945.95	1,173.63	3,266.01
Dacca	11,305.67	2,112.36	9,487.14	2,940.81
Mymensingh	39,366.96	17,827.44	25,397.27	34,791.05
Tangail	7,415.05	2,199.85	25,240.61	—
Sylhet	83,911.06	12,558.71	12,041.72	6,969.57
Comilla	10,105.61	471.02	1,850.15	1,004.28
Noakhali	7,554.63	405.46	—	1,057.13
Noakhali Colonisation	84,254.90	100.00	5,680.00	—
Chittagong	6,495.00	2,617.00	51,075.00	6,761.00
Total	415,267.83	47,612.38	192,774.88	72,813.26

Sources : Ministry of Land Administration and Land Reforms.

—=Nil.

Note : This is the picture of the availability at hand of *khas* land in March 1973, after which some land have been distributed. As a result of State acquisation, 1960, total excess land available was 163,740 acres which has already been included in the above table.

TABLE X

LAND ACQUIRED UNDER THE ACT OF 1950 AND COMPENSATION PAID

Districts	1956/57			1957/58			1959/60		
	Area Acquired	Compensation Paid	Compensation Per Acre	Area Acquired	Compensation Paid	Compensation Per Acre	Area Acquired	Compensation Paid	Compensation Per Acre
Dacca	1,187.11	2,661,783.33	2,242.24	1,555.75	3,757,316.29	2,415.12	3,135.99	4,851.161.00	1,546.93
Mymensingh	559.31	507,723.82	907.77	560.35	661,093.94	1,179.79	184.57	129,340.00	700.76
Faridpur	5,893.09	254,479.75	43.18	1,763.07	324,947.33	184.31	533.00	166,319.00	312.04
Khulna	60.27	75,978.62	1,260.64	52.68	32,732.81	621.35	228.00	97,376.00	427.09
Jessore	128.87	100,014.81	776.09	470.59	1,184,909.16	2,517.92	1,091.08	999,372.00	915.95
Kushtia	745.72	406,899.48	545.65	490.45	702,479.74	1,432.32	1,934.18	549.119.00	283.90
Bakerganj	6.53	11,218.64	1,718.02	416.01	13,674.46	32.87	687.78	85,186.00	123.86
Rajshahi				615.00	200,338.00	325.75	1,083.00	420,532.00	388.30
Dinajpur	875.34	158,539.71	181.12	194.37	83,347.59	428.81	871.05	259,568.00	297.99
Rangpur	732.48	389,446.59	531.68	817.69	1,003,908.94	1,227.74	790.62	469,026.00	593.24
Pabna	79.66	111,055.79	1,394.12	74.40	32,260.60	433.61	569.83	618,538.00	1,085.48
Bogra	1,434.84	110,967.17	77.34	1,438.90	228,188.14	158.59			
Chittagong	1,031.88	1,271,565.55	1,232,28	203.63	2,382,646.45	11,701.44	217.64	4,125,697.00	18,956.52
Comilla	6,513.66	4,549,415.85	698.44	5,714.01	4,932,981.56	863.31	145.68	309,845.00	2,126.89
Sylhet	974.35	757,156.13	777.09	319.95	379,115.09	1,184.92	793.23	802,258.00	1,011.38
Noakhali	662.25	1,358,727.34	2,051.68	220.37	344,228.46	1,562.05	85.14	34,071.00	400.18
Total	20,885.35	12,724,972.58	609.28	14,907.21	16,264,168.56	1,022.44	12,350.79	13,917,408.00	1,126.84

(contd.)

TABLE X *(Contd.)*

Districts	1960/61			1961/62			1962/63		
	Area Acquired	Compensation Paid	Compensation Per Acre	Area Acquired	Compensation Paid	Compensation Per acre	Area Acquired	Compensation Paid	Compensation Per Acre
Dacca	1,193.93	6,566,319.00	5,499.75	5,379.00	24,344.597	4,525.86	2,964.46	10,892,744	3,674.44
Mymensingh	180.05	281,388.00	1,562.83	341.24	130,229	381.63	181.59	348,431	1,918.78
Faridpur	729.21	169,218.00	232.06	1,181.47	441,638	373.80	405.49	264,008	651.08
Khulna	120.26	97,354.00	809.53	122.20	638,365	5,223.94	304.23	1,099,546	3,614.19
Jessore	2,295.25	1,147,876.00	500.11	1,065.24	846,192	794.37	2,043.82	1,761,875	862.05
Kushtia	853.02	514,162.00	602.75	1,354.70	1,053,360	777.56	465.35	857,488	1,842.67
Bakerganj	1.195.48	82,544.00	69.05	2,104.25	37,602	17.87	1,546.92	263,126	170.10
Rajshahi	525.00	792.808.00	1,510.11	739.00	1,473,556	1,993.99	1,476.00	3,075,267	2,083.51
Dinajpur	624.07	297,654.00	476.96	127.70	37,013	289.84	723.07	56,755	78.49
Rangpur	1,306.99	965,717.00	738.89	670.91	433,706	646.44	572.21	412,810	721.43
Pabna	256.42	94,008.00	366.62	197.16	51,672	262.08	494.90	518,679	1,048.05
Bogra	11.43	20,052.00	1,754.33	6.81	9,814	1,441.12	65.59	42,844	653.21
Chittagong	1,103.43	2,423,745.00	2,196.56	1,553.14	5,412,925	3,485.15	2,718.86	7,244,220	2,664.43
Comilla	406.81	1,248,004.00	3,067.78	694.35	2,592,256	3,733.36	109.34	1,685,978	15,419.59
Sylhet	157.62	392,919.00	2,492.82	359.41	514,279	1,430.89	490.02	532,297	1,086.28
Noakhali	2,518.37	1,592,547.00	632.37	125.11	187,656	1,499.93	480.98	660.850	1,373.97
Total	13,477.34	16,686,315.00	1,238.10	16,021.69	38,204,860	2,384.57	15,142.83	29,716,918	1,962.44

(contd.)

TABLE X (*contd.*)

Districts	1963/64			1965/66			1966/67		
	Area Acquired	Compensation Paid	Compensation Per Acre	Area Acquired	Compensation Paid	Compensation Per Acre	Area Acquired	Compensation Paid	Compensation Per Acre
Dacca	2,618.88	18,414,828	7,031.57	1,950.89	29,340,059.00	15,039.32	3,605.38	10,038,858.00	2,784.41
Mymensingh	554.83	1,256,610	2,264.86	232.57	386,424.32	1,661.54	138.00	307,815.92	2,230.55
Faridpur	687.00	814,124	1,185.04	2,463.89	31,706.76	20.99	2,966.08	1,106,371.84	373.01
Khulna	390.14	4,377,811	11,221.13	2,802.63	10,618,867.56	3,788.89	4,772.76	9,910,607.00	2,076.49
Jessore	777.97	2,217,815	2,850.77	391.47	1,023,8 .23	2,615.48	316.30	1,102,407.67	3,485.32
Kushtia	1,741.60	2,749,175	1,578.53	120.06	1,275,862.98	10,626.88	127.46	1,169,240.00	9,173.39
Bakerganj	2,007.57	1,413,531	704.10	287.24	579,381.11	2,017.06	874.90	736,167.87	841.43
Rajshahi	139.00	1,617,452	11,636.35	964.89	800,538.95	829.67	563.90	138,386.20	245.41
Dinajpur	325.62	497,241	1,527.06	302.88	1,130,048.99	3,731.01	311.86	1,558,553.18	4,997.61
Rangpur	712.00	633,382	889.58	739.57	802,045.47	1,084.48	299.34	230,495.47	770.01
Pabna	226.00	648,503	2,869.48	173.16	8,750,209.29	50,532.51	1,532.47	4,824,711.45	3,148.32
Bogra	90.43	420,853	4,653.91	701.97	1,613,868.75	2,299.06	1,491.59	1,509,910.00	1,079.32
Chittagong	4,704.00	11,967,861	2,544.19	945.61	10,832,648.48	11,455.73	3,332.77	12,494,771.32	3,749.06
Comilla	789.09	5,034.161	6,379.70	2,501.52	844,406.00	337.56	1,099.56	239,471.00	217.79
Sylhet	506.51	604,622	1,193.70	247.99	828,373.55	3,340.35	251.36	682,830.43	2,716.54
Noakhali	869.19	2,766,626	3,182.99	13,063.63	2,272,317.85	173.94	11,000.40	4,343,424.21	394.84
Total	17,039.83	55,434,595	3,253.24	27,888.97	71,130,639.29	2,551.21	32,684.13	50,494,021.56	1,544.91

(*contd.*)

TABLE X *(contd.)*

Districts	Total Area Acquired	Total Compensation Paid
Dacca	23,591.39	110,867,665.62
Mymensingh	2,932.51	4,009,056.00
Faridpur	16,622.30	3,572,812.68
Khulna	8,853.17	26,948,637.99
Jessore	8,580.59	10,384,341.87
Kushtia	7,832.54	9,277,786.20
Bakerganj	9,126.68	3,222,431.08
Rajshahi	6,105.79	8,518,878.15
Dinajpur	4,355.96	4,078,720.47
Rangpur	6,641.81	5,340,537.47
Pabna	3,604.00	15,649,637.13
Bogra	5,241.56	4,056,497.06
Chittagong	15,810.95	58,156,079.80
Comilla	17,974.02	21,436,518.41
Sylhet	4,100.44	5,493,850.20
Noakhali	29,025.04	13,560,447.86
Total	170,398.75	304,573,897.99

Note : Date for 1964/65 were not available.

Source : Various issues of Report of Land Revenue Administration, East Pakistan.

Notes and Comments

Employment Effects of the Green Revolution*

by

IFTIKHAR AHMED**

I. APPROACH TO MEASURING EMPLOYMENT EFFECTS

Any discussion on the employment effects of the High Yielding Variety (HYV) crops would have to be viewed in the context of the power techniques under use. Quite often the employment effects of HYV are compared to that of the traditional varieties of crops. In order to make such a comparison meaningful, we must be able to identify and assess the nature and magnitude of employment generated that can be clearly attributed to the HYV crops isolating the influence any other factor might have on employment. One factor which does influence the nature and magnitude of employment is the power technique (form and source of power and associated equipment) used. One way of comparing the pure employment effects of HYV with that of the traditional crops is to unambiguously state the power technique used and to hold it fixed while making the comparison.

II. PURE EMPLOYMENT EFFECTS OF HYVS

As indicated above an attempt will be made to compare the pure employment effects of HYV with that of traditional crops under a given power technique adequately described. First, we examine some of the evidence available for wheat from Pakistan and India. Next, we will look at the evidence available for rice from Bangladesh and the Philippines.[1]

Wheat

Pakistan : A comparison of labour requirements under traditional and HYV wheat crop is available for Hazara district in Pakistan (Table 1). Both types of

*The author is grately indebted to Professor Michael Lipton, Professor W.B. Reddaway and Dr. A. Ghafur of the Bangladesh Institute of Development Studies for their valuable comments. However, the author alone is responsible for any errors or inadequacies.

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[1]Assessment of the pure employment effects of HYV is rendered incomplete due to non-availability of information on the extent to which recommended doses of the inputs in the HYV technique were used. Inspite of this inadequacy, interesting insight is provided and a rough and more meaningful conclusion can be arrived at.

farms use traditional power techniques that is, use of unassisted human cum animal power and simple traditional implements to carry out most of the field-operations. The following interesting features are observed from the cross section data.

(a) For every hectare on which traditional wheat is replaced by HYV wheat, 205 man-hours of additional employment is generated and 614 kg. of additional output is produced.

(b) All stages of operations in the cultivation process have contributed to the enhanced employment (49% for the HYV wheat).

TABLE I

EMPLOYMENT : HYV AND TRADITIONAL WHEAT FARMS[a] USING TRADITIONAL POWER TECHNIQUES : HAZARA DISTRICT[b], PAKISTAN, 1969/70

(man-hours per hectare)

Operation	Traditional Farms	HYV Farms	Index (traditional=100)
Field Preparation and Sowing	154	239	155
Harvesting	129	184	143
Clara[a] and Threshing	69	100	145
Winnowing and Storage	65	99	152
Total for Crop	417	622	149
Yield (kilograms per hectare)	783	1,397	178

Notes : a. 143 unirrigated farms measuring on an average 4.94 acres.

b. Use of unassisted human cum animal power and simple traditional implements to carry out most of the field operations.

c. *Clara* is a threshing floor prepared by driving bullock teams in circles in a particular spot in the field until the ground is packed hard.

Source : [9, pp. 29 and 34].

India : Table II compares employment generated under traditional and HYV wheat farms (cross section) for Aligarh district in India using as before traditional power techniques. Main difference between Tables I and II is irrigation. The following picture emerges :

(a) For every hectare of traditional wheat replaced by HYV wheat 335 man-hours of additional employment is generated and 1,819 kilograms of additional wheat is produced.

TABLE II

EMPLOYMENT : HYV AND TRADITIONAL WHEAT FARMS[a] USING TRADITIONAL POWER TECHNIQUES[b] : ALIGARH

(man-hours per hectare)

Operations	Traditional Farms	HYV Farms	Index (traditional=100)
Preparatory Tillage	158	207	131
Sowing	40	73	183
Fertilization	33	96	291
Irrigation	108	139	129
Harvesting	116	177	152
Threshing and Winnowing	126	224	178
Total for Crop	581	916	158
Yield (kilograms per hectare[c])	1,884	3,703	197

Notes : a. 12 irrigated farms of average size=3.82 hectares.

b. Use of unassisted human cum animal power and simple traditional implements to carry out most of the field operations.

c. One Kilogram=2.2 pounds.

Source : [11].

(b) The overall labour utilization increases by 58 % over the traditional wheat and sowing, fertilization and threshing/winnowing operations contribute largely for the enhanced employment. Lower per hectare employment in Pakistan was due to the fact that HYV wheat was grown in unirrigated land and modern inputs (information on fertilization, etc. not provided) may not have been used to the extent to which it was done in India (although both areas may have used inputs below recommended levels).

Rice

Bangladesh : The following features are observed for the evidence obtained from Bangladesh and is shown in Table III.

TABLE III

EMPLOYMENT : HYV AND TRADITIONAL RICE FARMS[a] USING A LITTLE MECHANISATION : COMILLA DISTRICT, BANGLADESH : WINTER (BORO), 1967

(man-hours per hectare)

	Traditional Crops[a]		High Yield Variety		Index (boro=100)		
	Boro	Shaitta[c]	Tacipei 177	IR-8	Shaitta	Tacipei 177	IR-8
Number of Farms Operations	31	43	46	20			
Land Preparation	113	85	77	67	75	68	59
(tractor cost as percentage of tractor bullocks costs)	(9.7)	(10.5)	(21.3)	(36.2)	(108)	(220)	(373)
Sowing & Transplanting	284	10	342	328	4	120	115
Fertilization	49	77	81	105	157	165	214
Irrigation (use of tubewell)	38	33	32	26	87	84	68
Weeding	103	93	237	318	90	230	309
Plant Protection	8	6	16	34	75	200	425
Harvesting	235	243	253	314	103	108	134
Threshing	91	85	156	168	93	171	185
Total for Crop	921	632	1,194	1,360	69	130	148
Yield (kg. hectare)	2060	1,976	3,502	4,128	96	170	200

Notes : a. Average size of the farms is 0.14 hectare.

b. *Shaitta* and *boro* are traditional varieties.

c. *Shaitta* was broadcast.

Source : [5, Tables 3 : V, 4 : V, 5 : V and 6 : V].

(a) HYV rice provided between 30% to nearly 50% greater employment compared to traditional rice. For every hectare brought under the plough between 273 to 439 man-hours of additional employment is created.

(b) Fertilizer application, weeding, plant protection and threshing operations account for the bulk of the increase labour utilisation.

(c) The aforementioned increase in employment was also accompanied by doubling or near doubling of yields per acre.

(d) Employment figures for land preparation does not represent the pure employment effects of HYV because mechanised power used was not kept the same as under traditional rice. This is obvious : tractor use is between two to four times that used for traditional rice. The employment effects of HYV would naturally be higher if the mechanical power used for land preparation could have been kept constant.

Philippines : Table IV present the information on the employment effects of the HYV rice crop in the Philippines.

(a) In terms of total operational increase in employment per acre on HYV farms was 12% compared to that on traditional rice farms but this was associated with a 9% increase in yield per hectare.[2]

TABLE IV

EMPLOYMENT : HYV AND TRADITIONAL RICE FARMS USING PARTIAL MECHANISATION : CENTRAL LUZAN AND LAGUNA, PHILIPPINES, WET SEASON 1968

(man-hours per hectare)

	Traditional Crop	HYV Crop	Index (traditional=100)
Number of Farms	102	45	
Average Size (hectares)	2.5	2.6	
Operations			
Land Preparation	88	72	82
(% of farmers using tractors)	(27)	(36)	(133)
Transplanting	128	128	100
Weeding	48	88	183
(% of farmers using mechanical weeders)	(12)	(31)	(258)
Other Pre-harvest	72	80	111
Harvesting and Threshing	120	144	120
(% of farmers using mechanical threshers)	(68)	(69)	(102)
Total for Crop	456	512	112
Yield (kilogram/hectare)	2,300	2,500	109

Source : [3, Table A-3].

[2]Evidence from some other studies in the Philippines indicates that HYV output per hectare is remarkably higher than that of the traditional varieties of rice crop. See [7].

(b) Weeding, harvesting and threshing operations accounted for the increase in employment.

(c) However, the employment effect is shown under HYV rice does not truly represent the pure employment effects of HYV as the power technique used under the two types of farms have once again not been kept fixed. The relative labour requirements under HYV rice would have been higher than what is observed because (i) the proportion of farmers using tractors is 33% higher on HYV farms and (ii) the proportion of HYV farmers using mechanical weeders was more than two and a half times of that on the traditional rice-growing farms.

III. EMPLOYMENT EFFECTS OF HYV: VARYING POWER TECHNIQUE[3]

We have so far tried to examine the employment effects of HYV keeping the power technique fixed. In this section we trace the employment of a switch in power technique from traditional (use of unassisted human or human cum animal with simple tools and equipments) to partly mechanised (a substitution of mechanised power and improved tools and equipments for the ones under traditional in performing one or more of the field operations) by holding the HYV (bio-chemical) technique constant.

HYV Rice

The following results are observed from Table V.

(a) For every HYV acre on which the traditional technique is replaced by the partly mechanised one, nearly eight man-days of employment is foregone (13% less employment as compared to that under the former).

(b) Reduction in labour-use takes place in ploughing, puddling, levelling and threshing operations on account of the use of mechanised power and equipment. For weeding operation as well, the use of mechanised weeder reduces labour requirement.

HYV Wheat

The following results are observed from Table VI.

(a) For every HYV wheat acre on which the traditional power technique is replaced by the partly mechanised one, over ten man-days of employment is foregone (nearly 15% less employment compared to that under the traditional technique).

(b) It is observed that the above feature is true irrespective of farm size (with the only exception of the 14-24 hectare size group).

[3]The use of tractors for land preparation for the growing of HYVs does not appear to provide any clear yield advantage per unit of land. Evidence from India, Pakistan and the Philippines mostly point to this direction, although a few conflicting reports are also available [1].

TABLE V

EMPLOYMENT : HYV RICE UNDER VARYING POWER TECHNIQUES MINIPE, SRI LANKA, MAHA, 1969/70

(man-days per acre)

	Type of Power Technique		Difference	Index (tradition-al=100)
	Traditional (1)	Partly Mechanised (2)	(2)-(1)	
Number of Farms	15	25		
Average Size of Farms (acres)	3	5.5		
Source of Power	Buffaloes	Tractor Rotary Weeder		
Operations				
Ploughing lst and 2nd	10.53	4.93	−5.60	47
Bunding and Plastering	3.40	5.87	+2.47	173
Puddling and Levelling	6.20	3.27	−2.93	53
Cleaning Drains	1.00	0.86	−0.14	85
Nursery Prep. and Uprooting	4.90	5.24	+0.34	108
Transplanting	6.50	6.74	+0.24	104
Fertilizer Application	1.50	1.45	−0.05	97
Hand Weeding lst and 2nd	6.50	4.92	−1.58	76
Rotary Weeding lst and 2nd		0.51	+0.51	
Pesticide Application	0.30	0.53	+0.23	167
Repping/Collecting/Stacking	13.50	14.09	+0.59	104
Threshing	7.60	5.72	−1.88	75
Total	61.93	54.13	−7.80	87

Note : All 40 farmers grew HYV on approximately 82% of their total area and the varieties grown were IR-8, H-4, and H-8.

Source : [12, pp. 79 and 81, Table V].

TABLE VI

EMPLOYMENT : HYV WHEAT UNDER VARYING POWER TECHNIQUES BY FARM SIZE, FEROZEPUR DISTRICT, PUNJAB, INDIA, 1968/69

(man-days per hectare)

	Type of Power Technique		Difference (2)−(1)	Index (traditional =100)
	Traditional (1)	Partly Mechanised (2)		
Source of Power	Tubewell Bullocks	Tubewell Tractors		
Farm Size (hectares)				
Below 6	72.93			
6—9	71.93	61.47	−10.46	85.4
9—14	78.83	76.69	−2.14	97.2
14—24	53.30	57.33	+4.03	107.6
24 and above		39.45		
Average per Cropped Hectare	69.08	58.79	−10.29	85.1

Note : Near complete adoption (in terms of proportion of farmers and wheat area) is assumed for Ferozepur District. In Jundiala block 99% of the farmers grow HYV wheat in 84% of their wheat area and in Chola Saheb block 100%farmers grew HYV wheat on 99% of their wheat area [8, p. 17].

Source : [8, p. 172, Table 64].

IV. AN EMPLOYMENT MATRIX : BIO-CHEMICAL CUM POWER TECHNIQUES

So far we have developed two meaningful approaches by which to look at the employment generated in crop production. (a) First the pure employment effects of HYV (bio-chemical) technique was compared with that of the traditional (bio-chemical) technique by holding the power technique (power source plus associated equipment) as identical as possible (ideally should have been kept constant so that the employment generated could be clearly and completely attributed to the bio-chemical technique used). (b) Next the HYV technique was held constant in order to examine the employment effects under two different power techniques (traditional and partly mechanised).

This opens up a third approach. The nature of the employment generated with a simultaneous variation in both power and bio-chemical techniques would be of great interest. Theoretically, of course, infinite combinations of power and bio-chemical techniques could be visualised; here three types of each of the two categories of techniques (power-based and bio-chemical-based) are examined.

Thorbecke [10, pp. 87-88] originally identified three such combinations and viewed them as three technological alternatives open for the agricultural sector in the developing countries. Bartsch [4, pp. 32-37] developed it further into nine combinations representing nine different technological options. As a follow-up to this approach first of all the concept of a three by three employment matrix is developed and the elements are defined.

The first step is to define and classify the three types of bio-chemical and power techniques which we intend using in constructing the employment matrix. The classification is shown in the Chart 1.

The Employment Matrix

E is a 3 x 3 matrix with the bio-chemical techniques shown as the row vectors and power techniques as the column vectors so that a typical element $[e_{ij}]$ in such a matrix represents total labour requirement per unit of land (acre or hectare) for growing a crop using bio-chemical technique 'i' and power technique 'j'.

The next problem is to find data for the coefficients in the matrix. We will examine two such matrices, one for wheat and another for the rice crop from information compiled and constructed by Bartsch.

Wheat

The employment matrix for the wheat crop grown in Indian Punjab conditions is shown in Table VII. The following features are clear :

(a) Any movement from the traditional to HYV (bio-chemical) technique results in increased employment, any one power technique used having been kept constant (roughly employment increases by three and a half times over that under traditional).

(b) Any movement from traditional power technique to mechanised ones results in reduced employment when the bio-chemical technique is held constant (roughly employment reduces to one-fifth of that under the former).

(c) HYV technique combined with part mechanisation results in higher employment compared to the traditional-cum-traditional combination.

CHART 1

CLASSIFICATION OF TECHNIQUES

Bio-Chemical Technique Components	Traditional	Improved (Substitution of one or Some improved inputs)	High Yielding Variety
Type of seed	Traditional seeds	Improved local varieties or some HYV seeds	High yielding variety seeds
Type of irrigation[a]	Traditional or rainfed	Some irrigation water	Assured and controlled water supply
Type of fertilizer	Organic and no chemical fertilizer	Chemical fertilizer	Chemical fertilizer
Type of agro-chemical	No herbicide, pesticide or fungicide	Introduction of some agrochemicals	Herbicide, pesticide, and fungicide
Power Technique Particulars	**Traditional**	**Partly Mechanised**	**Mechanised**
Source of Power	Unassisted human or human cum animal power	Some source of power or partial substitution of mechanical power	Mechanical power used in one or many of the field operations being performed
Equipments	Simple traditional implements in carrying out most of the field operations	Improved implements and equipments	Equipments associated with the use of mechanical power

[a]Bio-hydro-chemical technique could perhaps have been a more appropriate term to use in order to reveal the fact that irrigation and drainage has been included.

TABLE VII

EMPLOYMENT MATRIX : WHEAT, INDIAN PUNJAB (SUBMONTANE ZONE) CONDITIONS

(man-hours per hectare)

Index 433 man-hours=100

Bio-Chemical Technique \ Powere Techniqu	Estimated[a] (Kg./Ha.)	Traditional	Partly Mechanised	Mechanised
Traditional	800	100	42	22
Improved	2,300	267	99	57
HYV	3,800	338	125	76

Note : a. It is reasonable to assume that use of tractor mechanisation provides no yield advantage (see footnote 3).

Source : [4, p. 36, Table 12 and p. 42, Table 15].

(d) The highest employment is generated for the HYV technique-cum- traditional power technique and the lowest when traditional (bio-chemical) technique is used in combination with mechanised technique.

Rice

A similar employment matrix is constructed for rice crop (transplanted) grown in Cuttack, Orissa, India (Table VIII).

(a) The same general characteristics are observed. When any one power technique is held constant, a movement from traditional (bio-chemical) to HYV technique increases employment (by about 15% to 23%). A movement from traditional (power) techniques to mechanised one, holding any one bio-chemical technique constant, leads to reduction in employment (employment level reduced to less than one-half of the former).

(b) The highest employment is generated when the HYV technique is used in conjunction with traditional power technique and the lowest when both traditional power and bio-chemical techniques are used.

TABLE VIII

EMPLOYMENT MATRIX : TRANSPLANTED RICE : CUTTACK, ORISSA, INDIA

(man-hours per hectare)

Index 1239 man-hours = 100

Bio-chemical Technique \ Power Technique		Traditional	Partly Traditional	Mechanised
	Estimated Yield[a] (Kg./Ha.)			
Traditional	1500	100	59	43
Improved	2100	113	63	46
HYV	3800	123	68	50

Note: a. It is reasonable to assume that the use of tractor mechanisation provides no yield advantage (see footnote on p.120).

Source : [4, p. 39, Table 13 and p. 42, Table 16].

V. POLICY IMPLICATIONS

If the objective is to maximise employment, the choice is obvious : the agricultural innovation would have to be aimed at attaining the combination of HYV technique in association with traditional power technique. In terms of our employment matrix the objective would be to arrive at a combination corresponding to element $[e_{31}]$. Of course, the primary interest in policy-making is concerned with inceasing agricultural output. But from the matrices in respect of both the crops, it is clear that this combination of techniques $[e_{31}]$ permits the fulfilment of the dual objectives of the maximisation of both employment and output, which in this case are also complementary to each other.

In general, although cash costs are higher in the cultivation of HYVs as compared to traditional crops, yet private profitability of growing the former is higher than that of the latter.[4] So, with appropriate price policies, in practical

[4]Evidence from international cross-section sources in support of this fact is available [2].

terms it may be possible to induce the farmer to adopt the socially optimal combination of techniques.

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A Note on Equiprofitable Jute-rice Price Ratio

by

GHOLAM MUSTAFA*

In July, 1973 of this journal Hossain and Quddus [1] have brought some interesting points. Their attempt to provide some solutions to certain basic problems is commendable. Certainly this will have some impact in our policy formulations. However, in our judgement, there is some methodological mistakes in their paper which might have led to wrong policy recommendations. In this short paper we would like to concentrate only on their chapter on "Optimum Jute-rice Price Ratio".

We fully agree with the authors that "the jute-rice price ratio largely influences the decision of the growers as to how much land he will put under jute relative to rice" [1, p. 283]. But, the way they arrived at the formula for jute-rice price ratio is wrong in my judgement. Hence, their estimation of equiprofitable jute-rice price for each district seems also to be wrong. Thus, their recommendation that the "the growers' price of jute should be 1.5 times higher than growers' price of *aus* rice at the national level" is questionable. Their recommendation and their estimation of equiprofitable price ratio is valid if and only if there were a happy situation of profit maximisation in case of *aus* rice. In reality no such situation exists in Bangladesh because of the limiting factor of land.

In this paper we proceed in three steps. In Step 1, we show that the authors failed to satisfy profit maximising condition as well as marginal profit equalising condition, which they aimed at. In Step 2, we present when and how they could do it right by satisfying profit maximising and marginal profit equalising conditions. Step 3 will contain a solution of the problem by satisfying marginal profit equalising condition but not profit maximising condition.

Hossain and Quddus obtained their critical price ratio formula with the assumption of no land constraint. They considered the following two profit maximising conditions :

$$MP_j P_j = MC_j. \qquad (1)$$

$$MP_a P_a = MC_a. \qquad (2)$$

*The author was a Deputy Chief of the Planning Commission, Bangladesh, while this note was prepared.

where, MP_j = production of jute on the marginal land per acre,
MP_a = production of *aus* rice on the marginal land per acre,
P_j = price of jute,
P_a = price of *aus* rice,
MC_j = cost of producing *aus* rice on the marginal land per acre,
and MC_a = cost of producing *aus* rice on the marginal land per acre.

By combining equation (1) and (2), the authors have arrived at a relation which they considered to be the critical price ratio between jute and *aus* rice.

$$\frac{P_j}{P_a} = \frac{MC_j}{MC_a} \quad \frac{MP_a}{MP_j}, \quad (3)$$

This is questionable. If equation (1) and (2) are true, equation (3) is also true. But, if equation (3) is true, does this guarantee that equation (1) and (2) will also be true ? Certainly not. Of course, if equation (3) and (2) are true then equation (1) is true. Empirically, the authors found out critical price ratio by satisfying equation (3)and took for guaranteed that equation (1) and (2) are also satisfied since equation (3) is derived from equation (1) and (2). In reality the authors' critical price ratio satisfied equation (3) but violated both equation (1) and (2). I will demonstrate this point with the help of data for Dacca from the authors' paper. The same can be shown for other districts of Bangladesh.

Our exercise is to seek equiprofitable price of jute in a situation where the price of *aus* rice is given. In their endeavour Hossain and Quddus derived their equation (equation 3) by combining two profit maximising equations. In doing so they have empirically violated both the profit maximising conditions, equation (1) and (2), as well as marginal profit equalising condition. Moreover, the fundamental equations (equation (1) and (2)) were obtained on the basis of an assumption of no land constraint which is difficult to justify in Bangladesh. In our exercise we shall satisfy marginal profit equalising condition without meeting the profit maximising condition. That will be more realistic in my judgement because in reality neither the no land constraint assumption extists nor we are seeking to control the price of *aus* rice as well.

Let us now observe the profit maximising condition and marginal profit equalising condition side by side. Equation (1) and (2) may be written as:

$MP_j P_j - MC_j = MP_a P_a - MC_a = 0,$
or $MNR_j = MNR_a = 0, \quad (4)$
where, $MNR_j = MP_j P_j - MC_j$
= Marginal net revenue of jute per acre;
and $MNR_a = MP_a P_a - MC_a$
= Marginal net revenue of rice per acre.

Equation (4) satisfies profit maximising condition for both jute and *aus* rice as well as marginal profit equalising condition. In view of the limiting land factor, we shall go for less than profit maximising condition and satisfy the marginal profit equalising condition.

$$MNR_j = MNR_a. \qquad (5)$$

Step 1. To demonstrate that the authors' price ratio equation (equation (3)) failed to satisfy the profit maximising condition (equation (4)) and the marginal profit equalising condition (equation (5)) in a real world situation, we shall pick up one example from the authors' paper.

Table (A) is constructed from the authors' paper. The procedure of calculation is indicated in the footnote of the table. Let us now take one example of Dacca. The authors have recommended profit maximising price ratio P_j/P_a to be 1.11 which will lead P_j to $P_a \times 1.11 = 31.49 \times 1.11 = 34.9539$. Let us now find MNR_j and MNR_a on the basis of this price ratio. Now for Dacca,

MP_j = 13.25 and
MP_a = 12.99 [1, p. 281]; and $P_a = 31.49$,
MC_a = 170.82 and $MC_j = 192.75$ (Table (A)) and therefore,
MNR_j = 270.39 $\neq 0$ (this violates profit maximising condition for jute),
and MNR_a = 238.24 $\neq 0$ (this violates profit maximising condition for *aus*).
Moreover, $MNR_j \neq MNR_a$ (this violates marginal profit equalising condition).

Therefore, the authors have violated the profit maximising condition (equation (4) which is equivalent to equation (1) and (2)) as well as marginal profit equalising condition. Same conclusion may be arrived at in case of other districts as well.

Step 2. Here we show how the authors could do it right, only to derive some nearly impossible results. Let us start from the two profit maximising equations,

$$MP_j P_j = MC_j,$$
and $$MP_a P_a = MC_a.$$

In these two equations, MP_j and MP_a are fixed in each district because of the nature of the production function which is assumed to be of the type $Y = a + bx + c$ MC_a and MC_j are assumed to be equal to their respective average costs. Therefore MC_a and MC_j are also assumed to be fixed. Therefore only things that are allowed to vary are P_a and P_j.

Thus profit maximising price of *aus* rice and jute would be,

$$P_a = \frac{MC_a}{MP_a} = \frac{170.82}{12.99} \text{ since,}$$
$$= 13.15,$$
and $$P_j = \frac{MC_j}{MP_j} = \frac{192.75}{13.25} = 14.55.$$

Figures for MC_a and MC_j are taken from Table A and those for MP_a and MP_j are taken from [1, p. 281].

Therefore, the conclusion is to suggest the growers of Bangladesh to produce *aus* rice and jute more and more until and unless the price comes down to Tk. 13.15 (against market price of Tk. 31.49) and Tk. 14.55 (against market price of Tk.29.78) respectively for *aus* rice and jute. Do we have that much unlimited land ? If we really do or if we assume to have that much land for the sake of theoretical discussion, then of course the authors are right in deriving the critical price ratio,

$$K=\frac{P_j}{P_a}=\frac{14.55}{13.15}=1.11 \text{ for Dacca.}$$

But, one should bear in mind that this price ratio is valid if and only if the price of *aus* rice is operating at the profit maximising level. In sum, what the authors obtained as critical price ratio is valid only when the price of *aus* rice operates at profit maximising level, but not when the price of *aus* rice is determined by the market force in less than optimum level. Our exercise is to recommend an equiprofitable price ratio for jute once the price of *aus* rice is given by the market force in a real world situation of Bangladesh. Our exercise is not to recommend an equiprofitable price ratio for jute in a situation where there exists an ideal profit maximising situation for *aus* rice in Bangladesh, a task the authors failed to accomplish.

Step 3. In this section we shall present a method of solving the problem by satisfying marginal profit equalising condition (or condition of equimarginal profit). Marginal profit equilising condition essentially comes from marginal net revenue approach which the authors themselves adopted while suggesting where to expand jute acreage. In their Table V they have derived marginal net revenue of jute and *aus* rice for each district. For those districts where marginal net revenue of jute is greater than marginal net revenue of *aus* rice, they have suggested to go for jute and viceversa. If marginal revenue of jute and *aus* rice in some district were equal, then the authors would not be in a position to suggest whether that district should go for jute or *aus* rice, because in that case those would have been equiprofitable. This should have been the premise to suggest equiprofitable price ratio. In fact K (which is discussed below) is derived out of this premise. We wonder why the authors switched over all on a sudden from marginal net revenue approach to some new approach, possibly wrong one, while dealing with the critical price ratio.

The critical price ratio of jute and *aus* rice logically should be such that equiprofitability of jute and *aus* rice at the margin is maintained. This can be done with or without maximising the profit. Hossain and Quddus attempted to do this by maximising the profit, but ended up with some results which neither maximise profit nor make the profit equal at the margin. In my attempt below, I will try to derive critical price ratio by equalising profit at the margin without

maximising the profit. Let K be the price ratio of jute and *aus* rice. Then $K=\frac{P_j}{P_a}$ i.e., $P_j=KP_a$. This along with the marginal profit equalising condition (5) gives,

$$KP_a\ MP_j - MC_j = P_a\ MP_a - MC_a,$$

$$\text{i.e.,} KP_a\ MP_j = MC_j - MC_a + P_a\ MP_a,$$

$$\text{i.e.,}\ K=\frac{MC_j - MC_a + P_a MP_a}{P_a MP_j},$$

$$\text{i.e.,}\ K=\frac{MC_j - MC_a}{P_a MP_j}+\frac{MP_a}{MP_j}. \quad (6)$$

Now let us see whether the critical price ratio (equation (6)) equalises profit at the margin.

For Dacca K=1.0326 (see Table A)

$$\therefore\ P_j = P_a \times 1.0326$$
$$= 31.49 \times 1.0326$$
$$= 32.5166$$

The question now boils down to what happens to MNR_j and MNR_a on the basis of this recommended price of jute and the market price of *aus* rice of Tk. 31.49.

$$MNR_j = MP_j P_j - MC_j$$
$$= 13.25 \times 32.5166 - 192.75$$
$$= 430.845 - 192.75$$
$$= 238.10$$
$$MNR_a = 238.24$$

$\therefore$ $MNR_j = MNR_a$ (small difference is due to rounding error).

Therefore marginal profit equalising condition is satisfied.

The nature of K (equation (6)) suggests that we cannot get a unique value of K for any value of *aus* rice price (P_a). In Dacca example we have K=1.0326. But, if P_a increases by 100 per cent, everything else remaining the same then K will change to 1.0063. Therefore, strictly speaking, we cannot suggest a unique value of K for all prices of *aus*, but we can suggest a set of K values for a possible set of future *aus* price, marginal costs of jute and *aus* rice etc.

Assuming however, that when the price of *aus* rice increases marginal costs (of both jute and *aus* rice) also increase in the same proportion, we can use the present set of K values, as indicated in Table A for planning purpose of Bangladesh.

Hossain and Quddus recommended jute-rice price ratio of 1.5 which went too much in favour of jute. The real jute-rice price ratio that should prevail in Bangladesh is 1.26 (approximately it may be taken as 1.25). This should create enough incentive in favour of jute.

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TABLE A

ESTIMATED JUTE-RICE PRICE RATIO FOR MARGINAL EQUIPROFITABILITY OF JUTE AND AUS RICE

Name of Districts	$\frac{MP_a}{MP_j}$	Market P_j	Market P_a	MC_j	MC_a	$MC_j - MC_a$	$P_a - MP_j$	$\frac{MC_j - MC_a}{P_a MP_j}$	$K = \frac{MC_j - MC_a}{P_a - MP_j} + \frac{MP_a}{MP_j}$
1	2	3	4	5	6	7	8	9	10
Dacca	0.98	29.78	31.49	192.75	170.82	21.93	417.24	.0526	1.0326
Mymensingh	0.99	,,	30.00	193.25	128.67	64.58	323.40	.1997	1.1897
Comilla	0.96	,,	28.49	217.80	146.91	70.89	401.71	.1764	1.1364
Rangpur	1.48	,,	26.24	168.28	122.47	45.81	217.00	.2110	1.6910
Rajshahi	1.18	,,	28.50	154.42	129.62	24.80	313.79	.0790	1.2590
Bogra	1.15	,,	25.88	149.69	130.32	19.37	273.55	.0708	1.2208
Dinajpur	0.99	,,	22.88	162.41	138.33	24.08	279.59	.0861	1.0761
Faridpur	0.80	,,	31.88	180.16	146.00	34.16	370.45	.0922	.8922
Jessore	0.82	,,	27.93	188.22	131.05	57.17	399.12	.1432	.9632
Pabna	0.59	,,	29.24	178.62	133.49	45.13	426.03	.1059	.6959
Sylhet	0.79	,,	28.30	212.78	129.37	83.41	490.72	.1670	.9570
Noakhali	0.79	,,	31.12	188.22	131.80	56.42	450.62	.1252	.9152
Khulna	0.96	,,	29.80	192.34	166.32	26.02	384.42	.0677	1.0277
Barisal	0.67	,,	25.49	155.02	111.68	43.34	383.11	.1131	.7831
Kushtia	1.18	,,	25.79	143.02	117.93	25.09	330.11	.0760	1.2560

Note : $MGR_a = MP_a P_a$,

$\therefore \quad P_a = \frac{MGR_a}{MP_a}$ and $P_j = \frac{MGR_j}{MP_j}$.

MP_j given in Col. 2, Table IV [1, p. 281].
MP_a ,, ,, ,, 3, ,, ,, [1, p. 281].
MGR_j ,, ,, ,, 1, Table V [1, p. 282].
MGR_a ,, ,, ,, 2, ,, ,, [1, p. 282].

A Note on Farm Size, Efficiency and the Socioeconomics of Land Distribution

by

MUHAMED G. QUIBRIA

I. INTRODUCTION

In a recent issue of this Journal, Md. Anisur Rahman sought to give an exposition of the theory of peasant economy. While his attempt is novel and commenable, his analysis is based throughout on two assumptions—constant returns to scale and the strict convexity of the cost (or compensation) function. But both these assumptions are highly restrictive at least in the context of peasant farming.[1] In the present note, we will relax these assumptions and incorporate the possibilities of increasing returns to scale and (weak) convexity of the cost function. And under such a generalised 'environment', we will find that most of the theoretical propositions that Rahman derived will not hold good.

In Section II, we deal with the question of comparative efficiency of 'small' peasant farming vis-a-vis 'large' peasant farming. Section III generalises the efficiency conditions of Rahman. In Section IV, we will show that under increasing returns to scale, joint farming produces more output and brings forth more work-efforts on the part of the individual peasants than what would have been forthcoming under individual farming.

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[1]The assumption that the production function exhibits constant returns to scale is unrealistic has been recognised by Rahman as well and he confesses that it is 'another abstraction from reality in so far as it ignores the effect of cooperation'. So far the cost function is concerned, the present author is not quite clear why the marginal cost should be rising over the entire domain. To the material needs of subsistence, if one adds the 'psychic cost' one might come up with the strictly convex cost function, but that has one old implication that the peasants are 'work-averse' throughout the entire domain. The present author is skeptic about the validity of the assumption. In that case, it will be rewarding to extend the analysis to include the possibility of the peasants being 'work-neutral'. However, it may be noted that even if Rahman is correct in his assumptiou of increasing marginal cost, the possibility of increasing returns to scale is enough to invalidate most of the theoretical propositions made by him.

II. COMPARATIVE EFFICIENCY OF SMALL FARMING VIS-A-VIS LARGE FARMING

Let us assume that the production function of the peasant-farmer is given by $q=f(x, z)$, where q refers to the amount of output, x refers to the amount of labour input and z refers to the farm size. For a given farmer, the farm size is assumed to be fixed. Again with a given farm, f is assumed to be (strictly) concave and smooth. Further, we assume that the production function exhibits non-decreasing returns to scale. To take care of this possibility, we assume that f is homogeneous of degree r where $r \geqq I$. The compensation function is given by C(x) and we assume C(x) is convex and smooth. The behavioural assumption that Rahman makes is that the peasant farmer maximises the surplus of output over costs. Now the problem of the surplus maximising peasant can be stated as :

$$\text{Maximise } f(x, z)-C(x)$$

The first-order condition for surplus maximisation is : $f_1 - C_1=o$, which implies that production should be carried to the point where the marginal product of labour is equal to the marginal cost of labour. Note that here the first-order condition is both necessary and sufficient for maximum, because the maximand is concave.

Now suppose, there is a change in the value of the parameter z. Taking the total differential of the first order condition for maximum and rearranging, one can obtain :

$$\frac{dx}{dz} = \frac{-f_{12}}{f_{11}-C_{11}} \qquad (1)$$

Given $f_{11} < o$, $f_{12} > o$, $C_{11} \geqq o$, clearly $\frac{dx}{dz} > o$.

Therefore, we have reached the following proposition :

Proposition I : As the farm size increases, the labour input of the surplus maximising farm also increases (or in the language of Rahman, the surplus maximising small peasant works less than the surplus maximising big peasant).

In the case f is homogeneous of degree r, the following relation holds :[2]

$$f_{12} = \frac{(r-1)f_1}{z} - \frac{f_{11}X}{z} \qquad (2)$$

[2]For proof, see the Appendix Sec. (i).

Substituting (2) in (1), one gets :

$$\frac{dx}{dz} = \frac{(f_{11}x)/z}{f_{11}-C_{11}} - \frac{(r-1)\ (f_1/z)}{f_{11}-C_{11}}$$

$$\frac{z}{x}\ \frac{dx}{dz} = \frac{f_{11}}{f_{11}-C_{11}} - \frac{(r-1)\ (f_1/x)}{f_{11}-C_{11}}$$

Now the L.H.S. of the expression, henceforth denoted by ε, is the elasticity of work efforts with respect to farm size. It measures the degree of responsiveness on the part of the peasant farmer with respect to his work efforts as the farm size increases. The possible values that ε can take will depend on the nature of the production and the cost function, and the results are summarised in the following table.

	$C_{11}=O$	$C_{11} > O$
$r = 1$	$\varepsilon = 1$	$\varepsilon < 1$,
$r > 1$	$\varepsilon > 1$	$\varepsilon \gtrless 1$ as $(r-1)\ (f_1/x) \gtrless C_{11}$

It is obvious from the table that the value of ε can be greater than, equal to or less than unity. Rahman's result is a special case of our more general result, with $r=1$, $C_{11} > O$.

Now let us see how the intensity of labour varies with the farm size.

Let us define $k = \frac{x}{z}$,

Now
$$\frac{dk}{dz} = \frac{1}{z}\left(\frac{dx}{dz}\right) - \frac{k}{z}$$
$$= \frac{1}{z}\left[\frac{dx}{dz} - k\right]$$
$$= \frac{1}{z}\left[\varepsilon\ \frac{x}{z} - k\right]$$
$$= \frac{1}{z}\left[\varepsilon\ k - k\right]$$
$$= \frac{1}{z}\left[k\ (\varepsilon - 1)\right].$$

Now $\frac{dk}{dz} \gtrless O$ depending on $\varepsilon \gtrless 1$. Therefore, we have reached the following proposition :

Proposition II : As the farm size increases, the labour intensity increases or

decreases or remains the same depending on whether the elasticity of work efforts with respect to land is greater than or equal to or less than unity.

Similar propositions can be derived with respect to average product per acre and average product in terms of labour input as Rahman does and it can be found that these results are highly sensitive to the value of the parameter ϵ.

III. THE GENERALISED EFFICIENCY CONDITIONS

Rahman identifies efficiency with surplus per acre. Given this criterion, our problem is to find the most efficient farm size. Note that in this case, we can vary both land and labour. Now the problem to be solved can be stated as :

$$\text{Maximise } [f(x, z) - C(x)] / z.$$

The necessary conditions (which are also sufficient) are :

$$f_1 = C_1$$
$$f_2 z = f - C.$$

The first condition implies that the marginal product of labour should be equal to the marginal cost of labour. The second condition implies that the total product imputed to land (according to the marginal productivity rule) should be equal to the total surplus. The surplus maximising farms which satisfy these two conditions define the efficient farms. In the case of constant returns to scale, the following relation holds :

$$f_2 z = f - f_1 x$$

Substituting this relation in the second condition of efficiency,we derive $f_1 = (C/x)$, the marginal product of labour=average cost of labour. Therefore, when constant returns to scale prevails, the efficiency conditions reduce to the following : marginal cost of labour=average cost of labour=minimum average cost of labour=marginal product of labour. This is the condition Rahman identifies. Because of his retrictive assumptions, he fails to identify the generalised conditions we have derived.

IV. JOINT FARMING

In this section, we will show that under increasing returns to scale joint farming pays—it makes all participating peasants better off. This can be seen very easily. Assume, there are λ number of farms, each of size z. We assume that all farms have identical production and cost functions. Further, the production function is assumed to be homogeneous of degree r. Now the problem before the joint farm can be stated as :

$$\text{Maximise } \lambda^r q - \lambda C.$$

The first-order condition for optimality is : $\lambda^{r-1}\left(\frac{dq}{dx}\right) = C_1$.

In the case of joint farming, when $\lambda \geqq 2$, $r > 1$, obviously the surplus maximising labour input and therefore output of each individual farming unit is higher than what would have been obtained under independent farming. This happens because under land pooling, each farmer finds that the marginal productivity of his labour input has shifted upwards and therefore, the old equilibrium solution no longer holds. He finds a new equilibrium to the right of the old equilibrium solution. The shift in the marginal productivity curve can be explained in terms of efficient organisation of work under land pooling.

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Appendix

(i) **Lemma** : If f is homogeneous of degree r, the following relation holds :

$$f_{12} = (r-1)\ \frac{f_1}{z} - \frac{f_{11}}{z}$$

Proof : If f is homogeneous of degree r, the following holds :

$$rf = f_1\ x + f_2\ z \text{ (Euler's theorem).}$$

Differentiating the above expression w.r.t. x and rearranging, we get the desired result. Q.E.D.

(ii) **Relationship between Average Product Per Acre and Farm Size**

Define $m \equiv \frac{f}{z}$ average product per acre.

Differentiating m w.r.t z, we get :

$$\frac{dm}{dz} = \frac{1}{z}\left[f_1 \frac{dx}{dz} + f_2 - m \right].$$

Under non-decreasing returns to scale, the following inequality holds :

$$f_2 \geqq \frac{f - f_1 x}{z}.$$

One can see the validity of the inequality directly from the Euler's theorem. Utilising the above inequality, we can derive the following :

$$\frac{dm}{dx} = \frac{1}{z}\left[f_1 \frac{dx}{dz} + f_2 - m \right] \geqq \frac{1}{z}\left[f_1 \frac{dx}{dz} + \frac{f - f_1 x}{z} - m \right].$$

Now consider the expression on the R.H.S. of the inequality :

$$\frac{1}{z}\left[f_1 \frac{dx}{dz} + \frac{f - f_1 x}{z} - m \right]$$

$$= \frac{1}{z}\left[f_1 \frac{\varepsilon x}{z} + \frac{f - f_1 x}{z} - m \right]$$

$$= \frac{1}{z}\left[\frac{f_1 \varepsilon x + f - f_1 x - m z}{z} \right]$$

$$= \frac{1}{z}\left[\frac{f_1 \varepsilon x + f - f_1 x - f}{z} \right] \qquad \text{Since } m z = f$$

$$= \frac{1}{z}\left[\frac{f_1 x (\varepsilon - 1)}{z} \right] \qquad \gtrless 0 \text{ as } \varepsilon \gtrless 1$$

Now let us see what happens to the sign of $\frac{dm}{dz}$

1) When $r = 1$ (constant returns to scale), $\frac{dm}{dz} \gtrless o$ depending on whether $\varepsilon \gtrless 1$. Note that in particular, if $\varepsilon < 1$ (which Rahman implicitly assumes), $\frac{dm}{dz} < o$ which conforms with the finding of Rahman.

2) When $r > 1$ (increasing returns to scale), $\frac{dm}{dz} > o$ as long as $\varepsilon \geqq 1$.

When $\varepsilon < 1$, $\frac{dm}{dz}$ may take any sign.

(iii) Relationship between Productivity Per Unit of Labour and Farm Size

Define $V \equiv \frac{f}{x}$ average product in terms of labour

Differentiating V w. r. t. z, one gets the following :

$$\frac{dv}{dz} = \frac{1}{x}\left[f_1 \frac{dx}{dz} + f_2 - v\frac{dx}{dz}\right]$$

$$= \frac{1}{x}\left[\left(f_1 - v\right)\frac{dx}{dz} + f_2\right]$$

$$= \frac{1}{x}\left[\left(f_1 - v\right)\ \varepsilon\ \frac{x}{z} + f_2\right].$$

We have found that under non-decreasing returns to scale, the following holds:

$$f_2 \geqq \frac{f - f_1 x}{z}$$

Substituting the above inequality in the expression for $\frac{dv}{dz}$, we can derive the following :

$$\frac{dv}{dz} = \frac{1}{x}\left[\left(f_1 - v\right)\varepsilon\ \frac{x}{z} + f_2\right] \geqq \frac{1}{x}\left[(f_1 - v)\,\varepsilon\,\frac{x}{z} + \frac{f - f_1 x}{z}\right].$$

Now consider the expression on the R.H.S. of the inequality

$$\frac{1}{x}\left[\left(f_1 - v\right)\varepsilon\frac{x}{z} + \frac{f - f_1 x}{z}\right]$$

$$= \frac{1}{x}\left[\frac{(f_1 - v)\ \varepsilon\ x + f - f_1 x}{z}\right]$$

$$= \frac{1}{x}\left[\frac{f_1\ \varepsilon\ x - v\ x\ \varepsilon + f - f_1 x}{z}\right]$$

$$= \frac{1}{x}\left[\frac{f_1\ \varepsilon\ x - f\ \varepsilon + f - f_1 x}{z}\right] \qquad \text{Since } vx = f$$

$$= \frac{1}{x}\left[\frac{f_1 x(\varepsilon - 1) - f(\varepsilon - 1)}{z}\right]$$

$$= \frac{1}{x}\left[\frac{(f_1 x - f)(\varepsilon - 1)}{z}\right]$$

$$= \frac{1}{x}\left[\frac{(f - f_1 x)(1 - \varepsilon)}{z}\right] \gtrless o \text{ depending on } \varepsilon \lessgtr 1.$$

With the above result in hand, we can see how productivity per unit of labour varies with farm size. We consider the following cases :

1) When $r = 1$ (constant returns to scale), $\frac{dv}{dz} \gtrless o$ depending on $\varepsilon \lessgtr 1$. In particular, if $\varepsilon < 1$, then $\frac{dv}{dz} > o$. Note this is the only case considered by Rahman.

2) If $r > 1$ (increasing returns to scale), then $\frac{dv}{dz} > o$ as long as $\varepsilon \leqq 1$. When $\varepsilon > 1$, $\frac{dv}{dz}$ may be of any sign.

"Farm Size, Efficiency and the Socioeconomics of Land Distribution"—Comment

by

ABU ABDULLAH*

I. INTRODUCTION

Professor Rahman's paper [4] is something of an intellectual *tour de force*. In recent years there have been a fair number of contributions to the theory of peasant economy [3; 5]. None of them in my opinion can match the sheer elegance of Professor Rahman's exposition, even though—or perhaps precisely because—they are much more liberal in their use of mathematics. In fact Professor Rahman's paper should serve as an object lesson how much can be achieved simply through words and diagrams. (It must be kept in mind, however, that a minimum mathematical background would be necessary to follow much of the verbal argument.)

This does not mean that I have no reservations about the paper. My reservations are at three different levels—one might call them, perhaps, analytical, meta-analytical, and meta-meta-analytical. That is, I shall question (i) one of his results, which seems to me to represent an analytical slip, (ii) some of the assumptions he makes in putting together his model, and (iii) the utility of this model-builder's approach for the "socioeconomics of land distribution" and for questions of development in general. The order in which I list them is in my opinion that of increasing importance, and they will be taken up in the same order.

II. THE LANDLESS AND THE EQUILIBRIUM WAGE

Assume a total agricultural population P, and total agricultural land Z. Let $N \leq P$ be the number of landowners, so that Z/N is the average farm size and P-N is the number of landless labourers. One of Professor Rahman's most interesting results is that, given his assumptions, (identical smoothly convex compensation curves, identical constant-returns-to-scale production functions, surplus-maximization, and no wage-labour supplied by landowners'), the maximum value of the equilibrium wage rate is independent both of the number of landless people and of the distribution of land among the land-owners. The argument is developed in his section VI, and is truly a dazzling example of economic reasoning in

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the classic manner of say, Abba Lerner. However, Professor Rahman must have relaxed his vigilance for a moment for a small error has crept in at the very end of his analysis. When this error is corrected, the rather startling conclusion no longer holds.

Professor Rahman's proof is in two parts. First he proves that the equilibrium wage is independent of the number of landless people (remember that the total number of 'peasants'—landless and landowners—is fixed) as long as all the land is divided equally among the landowners. This part of the argument is perfectly valid, and can in fact be demonstrated with the aid of some algebra and a diagram, both somewhat simpler than those used by the author. (I use Professor Rahman's notation, with the additional definition of $N \equiv Z/z$.

First, equating the expressions for demand for and supply of wage-labour as given by the author [4,p.315], we obtain the market-clearing condition :

$$N(1-l_1) = (P-N)l,$$

$$\text{or} \quad N.1 = P.l_1$$

$$\text{or} \quad \frac{l_1}{l} = \frac{N}{P} \qquad (1)$$

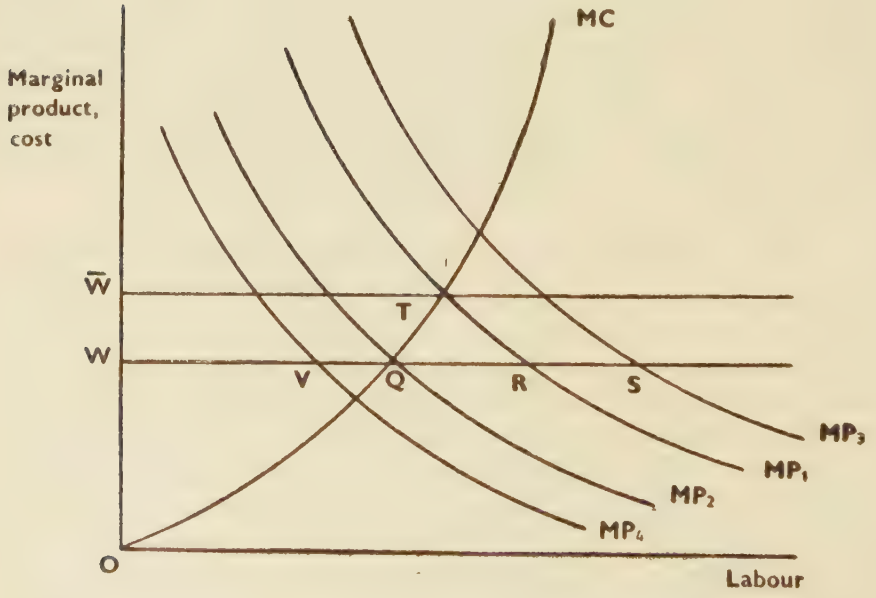


Figure 1

Now look at Figure 1,ignoring for the moment all curves except those labelled MC and MP_1, and the two horizontal straight lines starting from points labelled W and $\bar{W}$. Let MP_1 be the marginal-product-of-labour curve for farm size $z=Z/N$, MC is the marginal compensation curve. $\bar{W}$ is the highest wage rate at which the farm will demand non-negative quantities of wage-labour—i.e., it is the highest wage rate which satisfies the relevancy condition.

Let W be any wage rate between O and $\bar{W}$. We note that at this wage $1=WR$, $1_1=WQ$, and that as W goes from zero to $\bar{W}$, the ratio $1_1/1$ $(=WQ/WR)$ goes from zero to one. Since N/P must also lie in this interval, this proves the existence of an equilibrium wage. No matter what value N/P takes, there must exist some positive wage rate which will satisfy the relevancy condition and the market-clearing condition.

Let us now assume that for the farm size corresponding to MP_1, W is in fact the equilibrium wage. Now suppose that the number of farms is reduced by ΔN, that is Δ N landowning families are evicted, and go to swell the labour market, while their land is distributed equally among the remaining landowning households. Let MP_2 be the marginal product-of-labour curve corresponding to the new farm size. Now letting $\Delta N/N=\gamma_N$, we see that the proportionate increase in farm size is given by

$$\gamma_z=\frac{\Delta z}{z}=\frac{N}{Z}\left[\frac{z}{N-\Delta N}-\frac{Z}{N}\right]$$

$$=\frac{N}{N-\Delta N}-1$$

$$=\frac{\Delta N}{N-\Delta N}=\frac{\gamma_N}{1-\gamma_n} \qquad (2)$$

By constant returns to scale,total labour absorption by each farm will also increase in the same proportion at the old wage rate.

We have therefore, at wage W,

$$\frac{1_1}{1+\Delta 1}=\frac{1_1}{1(1+\gamma_z)}=\frac{1_1(1-\gamma_n)}{1}$$

$$=\frac{N}{P}(1-\gamma_n) \quad \text{from (1)}$$

$$=\frac{N-\Delta N}{P} \qquad (3)$$

Thus W is also an equilibrium wage for the new situation. This proves that as long as all landowners have the same farm size, the wage rate is independent of the number of landless people.

The next step is to demonstrate that, given a division of peasants between landowners and landless the equilibrium wage cannot exceed the equal-farm size rate for any distribution of land among the landowners. Professor Rahman offers his proof in the following words :

"Aggregate supply of wage labour at wage rate $\bar{w}$ will be the same for any such distribution as the number of landless peasants remains the same. Because of constant returns to scale, the total demand for labour, including self-labour, from an individual farm will be proportional to farm size at any given wage rate... for all those farms which satisfy the relevancy condition for the given wage rate; thus if the relevancy condition was satisfied for all farms, aggregate total demand for labour, and hence aggregate demand for wage labour (since each peasant farmer will supply the same amount of self-labour l_1) will be the same as if all peasant farmers had the same amount of land Z/z. *On the other hand, if some farm sizes are too-small so that the relevancy condition is not satisfied, aggregate demand for wage-labour will be smaller than the above.* Thus at wage rate $\bar{w}$ aggregate excess demand for wage-labour can only be zero or negative.... Hence the equilibrium wage-rate for any distribution of land cannot exceed $\bar{w}$ as defined" [4, P. 317 ; italics are mine].

The sentence I have italicized is wrong—in fact it is the opposite of the truth. Any redistribution (of the given amount of land among the given number of landowners) from farms on or below the margin of the relevancy condition to farms above it will raise the demand for wage labour at any given wage rate. At least some redistribution that transfers land from one "relevant" farm to another in such a manner as to cause the first farm to become "irrelevant" will do the same.

To see this, look at Figure 1 again. Suppose to begin with there are only two farms with marginal-product curves MP_1 and MP_2. Suppose W is the equilibrium wage rate, with total demand for wage labour equal to QR. (only farm 1 uses hired labour, while farm 2 just fulfils the relevancy condition.) Now let some land be taken away from farm 2 and added to farm 1, so that their marginal product curves shift to MP_4 and MP_3 respectively. Farm 2 now violates the relevancy condition, and clearly still demands no wage labour. Farm 1, however, now demands wage labour to the extent of QS, which is greater than QR. Thus at the previous equilibrium wage, there is now excess demand for wage labour, since supply is given by definition.

From Figure 1 it is also easy to locate the source of the trouble. A farm with marginal-product curve MP_4 would, given surplus-maximization, want to supply wage labour to that amount QV. If this were permitted, then by constant returns to scale the rises in labour demand caused by any redistribution would be

always offset by rises in supply from farms violating the "relevancy condition", and Professor Rahman's result would be restored—indeed strengthened, since then we could say that the equilibrium wage is completely determined by the land-labour ratio, technology, and the shape of the compensation curve. It is not in fact very clear why Professor Rahman wanted to rule out supply of wage labour by landowners (as he does in footnote 9, p. 314). It is an assumption that is intellectually unsatisfactory, analytically inconvenient and empirically invalid.

III. SOME KEY ASSUMPTIONS

In Professor Rahman's model, all peasants maximize a magnitude called surplus, which is defined as the excess of production over the material and psychic costs of peasant labour. Here, it seems to me, he falls between two stools. If he were to stick simply to the material costs (a sort of strictly biological notion of "value of labour-power") then there is no guarantee that this would be behaviorally relevant—the peasant in locating his optimum point will undoubtedly take account of psychic costs as well. But as soon as we so define the compensation curve, this becomes the analytic and substantive equivalent of an income-leisure indifference curve. This is something Professor Rahman explicitly disclaims (in footnote 1, p.305), but the disclaimer seems to me to be beside the point. According to him this identification cannot be made because the compensation curve "includes also the extra material needs of subsistence that goes with extra manual work". But who ever said that this violates the definition of an indifference curve ? At best one may say that the underlying arguments about the nature of the material needs and the distinction between primary and secondary costs allows us to locate and plot one critical indifference curve. and deduce some properties of the utility surface.

One may say in fact that implicit in Professor Rahman's logic is an income-labour utility function of a special type :

$$u\ (q,\ x) \equiv q - C\ (x)$$

and his arguments are developed to justify this choice. Clearly with a more general utility function one could not achieve the sharp results the author has given us.

Reading between the lines, the logic for surplus-maximization seems to be as follows : given any labour input x and corresponding output q(x), an amount C(x) goes just to compensate the peasant for his labour—to keep his total utility, so to speak, at zero level. Any excess over this amount is available for net

additions to utility. Since utility is the same (zero) at all points on the compensation curve, a given quantity of additional income should be worth the same at all such points. This would imply indifference curves that are vertical displacements of one another, and in that case, it can be easily seen, the more general tangency solution would yield the same result as the surplus-maximization solution. The trouble with this argument is that if it were valid, then it should hold for any indifference map whatsoever.

In my opinion the defense of the surplus-maximization assumption is best conducted not along the lines of its intuitive plausibility, which is specious,but on the Chicago-school-like ground that the implications that follow from this hypothesis accord with some "stylized facts" of peasant economies--in particular lower labour intensities and output per acre on larger farms. However,as we saw above, when another undeniable fact of peasant life, the presence of wage labour, is incorporated, the model no longer explains these stylized facts. I am sure that Professor Rahman is not such a Chicagoan as to insist that this proves the superiority of a model that abstracts from wage labour. It is true that he conducts most of his analysis on the basis of such a model, where there is neither wage labour nor sharecropping. Which brings me to what I called the meta-meta-analytic part of my comments.

I suspect that this assumption was more or less forced on him by his analysis in earlier sections. For once we allow landowners to consider wage labour as an alternative, the simplicity and sharpness of the results he obtains on, e.g.,the relative factor-intensities and efficiency of small vs. large farms are lost. In fact, once we permit a wage labour market untramelled by prestige considerations, factor intensities and factor productivities become independent of the compensation curve except in sofar as it helps determine the equilibrium wage-rate, and at any given wage these are equal for all farm sizes.

IV. OF MODELS AND ABSTRACTIONS

Any model is an abstraction from reality, and questioning the assumptions of a model can become an irrelevant exercise. Nevertheless,from the same reality different aspects can be abstracted depending on one's view of what is important and what is not. Professor Rahman's model, for example, assumes away markets for produce, transactions in land (sale and/or lease), moneylending, as well as, until the last section, wage labour. He appears to believe that theorems that hold for a hypothetical economy where all farms use own land and own labour to produce own consumption plus a surplus whose disposal remains a mystery (is all of it consumed ?) have relevance for the real world. This would be true if (i)

the real world resembled (not necessarily exactly, but in important respects) this economy, or (ii) if the theorems were relatively insensitive to changes in these assumptions. I do not think either of the above conditions hold—the first may have held for some times and places, but certainly not for any area of the world today. This particular conceptualization belongs to a vision of society for which the peasantry constitute essentially a 'peasant' or 'household' mode of production, where markets, capitalism, or semi-feudal modes of production and exploitation are at best marginal phenomena, and hence can be safely abstracted from. This is how I argued some time back [1], I no longer hold this opinion.

These inadequacies of this whole approach come out quite clearly in the discussions on farm size and efficiency. There is a whole school of thought that builds up a case for land redistribution on the grounds that (i) this would promote equity, and (ii) that small farms have higher output and labour absorption per acre than large farms. The problem is that here the whole question is abstracted, is artificially torn out, from its institutional setting. Small peasant farms are compared with large peasant farms. Now it is quite possible, indeed likely that under certain circumstances a regime of small peasant farms, in spite of higher aggregate output and employment, would form a stagnant and backward dead-weight on development, while a more inegalitarian distribution of land would facilitate the development of a productive capitalistic sector (Under other circumstances, of course, the opposite might be true) [2,pp.276-293]. Only a flabby sentimentalism can pronounce in favour of small farming without taking these fundamental considerations into account. Neither Professor Rahman's nor any other model that I have seen reveal an awareness of these problems. It would perhaps be presumptions and premature to say that mathematical model building cannot by its nature address itself to the question of transitions between modes of production—for that in the last analysis is the question—but certain no one to my knowledge has made the attempt. In the meantime, models like these serve to conceal rather than reveal the lineaments of the real problem.

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Book Reviews

Production Conditions in Indian Agriculture : A Study Based on Farm Management Surveys by Krishna Bharadwaj (Cambridge: Cambridge University Press, 1974, pp.x+128, £ 4.00 Hard Cover, £ 1.75 Paper Back).

There was a dominant idea in the fifties and sixties that industrial development is the panacea of all economic ills in the third world countries. As a result much effort went into and emphasis was put on establishing manufacturing industries. It was, however, slowly realised that in most of these countries there cannot be any meaningful economic growth or stability without the simultaneous, if not prior, development of agriculture. This realisation made acquisition of knowledge about production methods, conditions and relations in agriculture essential. One way which is not wholly satisfactory, of acquisition of such knowledge is to conduct farm management surveys. Krishna Bharadwaj's monograph is based on the findings of such surveys conducted in various parts of India in the late fifties.

The booklet is divided into eight chapters and eight appendices. These deal with among others the relationship between size of farm and productivity and between labour use and productivity. The uses of other inputs like bullock labour, machinery and irrigation with respect to size of farm are also discussed.

The chapter that should interest the readers most is the one on relation between size of farm and value of output per acre. Mrs. Bharadwaj discusses the various explanations that have been put forward to explain the alleged inverse relationship between the two. She has concluded that none of these explanations are adequate. Factors like differences in cropping intensity and cropping patterns should also be considered. Her statistical exercises are used to prove this point. The differences in cropping intensity and cropping pattern are, however, determined by the type of the market, the resource position and bargaining strength of the peasant and his involvement in the market. Unfortunately as Mrs. Bharadwaj herself says in the beginning, given the nature of the data even a limited discussion of these is not possible. We find ourselves in a blind lane.

So, the small and neatly pieced together treatise serves only as a useful survey to begin with in the search for more adequate explanations of the observed technological relationships. Obviously more farm management surveys would not help in that search. More intensive and in-depth multi-disciplinary village

studies on a round the year basis are needed, instead. Only then the "production conditions" shaping the lives of millions of peasants may be known.

Bangladesh Institute of Development Studies **Md. Asaduzzaman**
Dacca

Economic Theory and Planning, edited by Ashok Mitra; Oxford University Press, Calcutta, 1974 : xvi + 326 pages; Rs. 50.

This book is a compilation of twenty three essays written by the former students/colleagues of Professor A.K. Dasgupta. The book is divided into two sections. The first, mainly theoretical, brings the creative diversity and philosophical precision of a dozen English and Indian economists to bear on a whole spectrum of issues, concepts, controversies, the analytic slant nearly always being broadly Marxian. The second section is more diverse not only in substance but in approach. Reviewing all the articles of such a diverse book is a difficult job and, frankly, outside the inclination of this reviewer. A selective review of only six essays has therefore been made.

Professor Sen's essay, "On Some Debates in Capital Theory", is couched in a dramatic dialogue and contains an useful survey of almost all seminal contributions to the long-drawn-out debate in capital theory. The essay exudes conceptual clarity and intellectual brilliance throughout. In connection with the discussion about choosing between bulldozers and man-and-baskets as earth-movers in labour-surplus economies in a hypothetical irrigation project (p.46) the factor of time must be made explicit in the analysis. Relatively labour using techniques may, in fact, be relatively capital-using if the gestation period for the former is vastly extended and if capital is shadow-priced, as it should be.

Joan Robinson, essentially serving the old cambridge wine in a new bottle in her essay 'The Abdication of Neo-Classical Economics', nonetheless envigorates the mind because she exposes, again, the almost irreconcilable isolation that sets orthodox economics apart from economic reality. However, the last paragraphs of the essay seem to stress xenophobia (in relation to foreign aid, the multinationals) as imperative for LDCs, if balance of payments problems, arising from consumption out of profits and from profit remittances by multinationals, are to be redressed. However, owing to almost similar demand profiles in some countries balance of payments problems are sometimes due as much to consumption out of urban wages as profits. And these remittances or debt service charges may well be the necessary price for output growth in a

relatively short period in many LDCs, given the institutional, structural and financial limitations.

Bhaduri sets out in "Towards a Theory of Pre-capitalistic Exchange", a brief but neat (and hence over simplified) model to show how high indebtedness forces the small farmer to adopt distress selling of grains right after harvest and how survival forces him to adopt distress buying of the same from the merchants. Consequently, the small man is more involved in an unequal exchange on the market than the large farmers. However, the specification of the model can be considerably improved by explicitly introducing the large farmers in the market. This point is worth a deeper pursuit. Assume that the large farmers have a relatively large marketable surplus of grain and that, under normal circumstances, they like to store grain expecting higher prices. The grain market thus is duopolistic. The merchants and the landed aristocracy coexist. Will they have identical class interests? Not necessarily. They may have deep ancestral, religious differences. Afghan and marwari money lenders, once common in ancient Bengal, sharply constrasted with Bengalee aristocracy. If, therefore, duopolistic collusion is ruled out and if the two classes react by way of a price war, then there is a case that the actual magnitude of exploitation, other things being equal, would be less than is implied by Bhaduri's first approximation model.

Lefebar's article "On the Paradigm for Economic Development" is basically a rejection of the relevance of the paradigm for development in the capitalist West to the current LDCs. However, his interpretation of this paradigm apparently emphasizes favourable demand and supply conditions only to the neglect of values, attitudes, institutions as partial vehicles for growth in the West. Since these subjective things are among the basic ingredients of the capitalist paradigm, and since these can reasonably be postulated to be independent of the demand and supply factors, this paradigm is probably not absolutely irrelevant for the LDCs.

Nurul Islam's paper is a thought-provoking piece of work on practical problems of plan formulation and implementation in typical LDCs, the country at hand for illustrative purposes being Bangladesh. However, there appears to be inadequate emphasis on project planning based on scarcity prices. In an already long article, one would still have liked a discussion of policies which ought to have been taken in Bangladesh to minimize the "considerable divergence" between the First Five Year Plan and its implementation in Bangladesh.

Bose's paper is an extension upto 1973 of his previous, and famous, paper of 1968, which has been a good example of how careful analysis can circumvent the paucity of good data and still emerge with socially vital information, which is

what economic research is all about. However, on p. 257, Bose contends, "But lack of weighting (of daily district wage rates) due to non-availability of necessary data is unlikely to have seriously distorted the estimates of the wage rate movement over time". The implication is that seasonal variations in the level of employment and the relative importance of wage employment in different districts is thought by Bose to have remained broadly identical over time. The first implication can be granted only if there were firm evidence that cropping pattern, which is probably the most important determinant of seasonal variation of the demand for labour, in the districts over time had remained broadly identical. However, there is contrary evidence that throughout much of the 1950s and 1960s, the relative price of jute to rice was highly unfavourable against the former, and this might have caused a change in cropping pattern in many jute-growing districts. In the second place, the relative importance of wage employment in the districts may not have remained the same. This may hold, *a fortiori*, for the relatively industrialised districts owing to the phenomenon of rural-urban migration. Where expected income from urban employment greatly exceeds average product in agriculture, it can be argued that migration will ensue and probably be substantial. And if the migration grows at a faster rate than agricultural labour force, the relative importance of wage employment in rural areas may diminish over time. Non-weighting could then introduce systematic bias in the estimates. Whether this has in fact taken place in Bangladesh is an empirical question, but it is the duty of this reviewer to expose this qualification to Bose's abovegoing contention.

On the whole, the book is worthwhile for one with a passion for a diversity in economic thought and its applications.

Bangladesh Institute of Development Studies
Dacca

Nuimuddin Chowdhury

Operations and Effects of the Generalized System of Preferences. Selected studies submitted to the fifth session of the Special Committee on Preference ; United Nations : New York, 1974.

This volume is the first systematic account of the operations and effects of what has been given the imposing name of Generalised System of Preference (GSP), and hence is an important one for both planners and students of economic development in the less developed countries (LDCs). Pertinently, the GSP consists of individual schemes by preference-giving countries varying in terms of product coverage, depth of tariff cuts, safeguard mechanisms against real or

perceived damages due to preferences afforded and rules of origin. The volume is important because it poses a qualified answer to an important question about the relative effectiveness of the GSP as a catalyst for augmenting the export earnings and industrialisation in the developing countries. It is important because it confirms, albeit partially, the essentially "yes, but" attitude of the developed countries vis-a-vis industrialisation in the Third World.

The volume is a collection of studies, prepared at the UNCTAD Secretariat, presented to the Special Committee on Preferences of the UNCTAD at the time of its first review of the implementation of the GSP. Now, the first of these studies is an analytical and empirical synopsis of conclusions as to the operational facets and economic effects of the GSP—each conclusion having been substantiated in subsequent, component studies. In general, the *modus operandi* of the GSP—and the many associated caveats—are both well dealt with, as also their trade implications given both the present and prospective framework of international commercial policies.

The second study, "Special Measures in Favour of the Least Developed among the Developing Countries (LDDCs)" is somewhat inappropriately named since the special measures take only one-sixth of the study, the bulk of it being devoted to the importance of product coverage in the GSP to these countries. But this should not subtract from the encyclopaedic account in this study of the implications of individual schemes of EEC, Japan, and the UK for almost all the major and minor exports of the LDCs.

The third study asks whether, and to what extent, are the African countries associated with EEC sharing their tariff preferences because of the GSP. It concludes that such sharing of tariff preferences is insubstantial, as of 1970, not least because for some important products EEC has imposed more stringent conditions of import under the GSP than under Yaounde Convention. The fourth study is a comparative study of operational rules of origin. In connection with the discussion, on page 108, about differences in rules of origin stemming from variations in product coverage, it appears that such differences, in an operational sense may stem from variations in the safeguard mechanisms in the individual country schemes, although this is not dealt with in the study.

The next three are in-depth case studies, combining description, evaluation and suggested improvements, of the operation and effects of generalized preferences granted by the EEC, Japan and the UK. These three studies are probably the most important parts of the volume, from empirical and analytical stand points. The caveats underlying the EEC and Japan's schemes which, in effect, specialize rather than generalize the GSP in favour of politically favoured minor

suppliers (in the case of EEC, especially), are given a sharp analytical attention and deserves close study. At last study focusses on the effects of the enlargement of the EEC on the GSP.

In general, the volume is a scholarly one, displaying really microscopic knowledge of the trade implications of the GSP almost by countries, large and small, and commodities, more or less important. However, in our view the effectiveness of GSP has been evaluated on the basis of only one of the various feasible criteria : (a) distribution of trade advantages by developing countries, (b) distribution of trade advantages by commodities classified as per relative importance in developing country exports ; (c) distribution of trade advantages by manufacturing activities located in developing countries classified as per intensity of use of domestic as opposed to expatriate resources. In fairness to the volume at hand, the data problems and time limitations must have dictated the choice of (a) as the basis of evaluation. But it must be pointed out that, owing to recent developments as pertain to the worldwide distribution of manufacturing activities associated with the very controversial multinational corporations (MNCs), incremental trade in manufactures and semi-manufacture, without an explicit examination of the quality of that trade in terms of relations participation of domestic vis-a-vis alien factors of production, must be considered a limited basis for evaluation of the GSP. Just as the development economists are evaluating development not merely by reference to income growth but the quality of such growth in terms of changes in interpersonal income distribution and in the poverty income level, so also in the trade area, such an anatomy of incremental trade opportunities is called for, before welfare deductions begin to be made.

Nonetheless the volume upholds and furthers UNCTAD's position as a serious school disseminating knowledge of the interactions of trade and development.

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Corrigenda for BDS Vol. IV, No. 2, April 1976

Page No.	Line of text from the top	What has been printed	What should have been printed
193	12	fuel tea	fuel and tea
194	34	5%	50%
195	13 (Table IV)	(nil)	180.0
196	2	commission gross	commission on gross
196	7	Table V	Table III
196	27	Tables III and V	Table III and Table IV
196	3 (in foot note)	by 4	by 4%
197	(in between line 8 and 9 please read) on the world market. Data on production costs in other producing countries (like India)		
198	8	to have attained significant	to be significant
200	32	per cent	present
201	8	crops or which	crops or fruits for which
201	22	essential	essentially
201	25	economies	economises
201	27	nationalise	rationalise
	28	broadly	broader
210	33	Table A-1	Appendix Table A-1
212	19	about held	about half
212	27	Appendix Table II	Appendix Table A-2
215	5	actually dedines	actually declines
216	23	million areas	million acres
226	24	Appendix Tables IV and V	Appendix Tables A-4 and A-5
273	13 (in Table V)	130*	130 (be read in line 12)
289	11	White's purports	White purports
290	19	argues	argued
291	2 (from below)	I is justified	I think is justified
293	7	importing	imparting
293	5 (from below)	perception of the expert	perceptions of the export
294	6	eudcation	education
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The Three Great Struggles in the Chinese Countryside : A Case Study

PART I

by

A. Z. M. Obaidullah Khan*

I. INTRODUCTION

"Where do correct ideas come from ? Do they drop from the sky ? No. Are they innate in the mind ? No, they come from social practice, and from it alone ; they come from three kinds of social practice, the struggle for production, class-struggle and scientific experiment".[1] What do these three struggles mean in concrete terms in the Chinese country-side? How are they interrelated? These are the questions which I shall try to explore in this essay. The method followed is that of a case study of a single commune, Howang Tu Kang or the Yellow Sand hills located in the Southern suburbs of Peking, a little to the West. The commune has a diversified economy but its principal task is to produce a year-round supply of vegetables for the city of Peking. Since liberation it has improved the quality of its land by levelling and irrigating the extensive sand-dune in the south from which it takes its name and by draining other land to the north which was habitually water-logged—it used to be said that even the "frogs' urine floods the land".

I conducted a series of interviews with the Chairman of the Revolutionary Committee of the commune and other members from July 1971 to January 1972. The visits and accommodation were arranged for me by the Ministry of Economic relations with foreign countries after I had put in a request with Madame Chen Mu-hua, then Director, later vice-minister, for an opportunity to investigate the running of a commune in greater depth than is afforded by the usual one-day trip. During the interviews I was assisted by a Division-chief

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[1]Mao Tse-tung, *Four Essays on Philosophy* (Peking : Foreign Language Press, 1968), p.134 .

of the Ministry, an interpreter, also from the Ministry, and my colleague, then Mr. Riaz M. Khan who was a student of Chinese language.

My main source of information has been Comrade Ying Wei-chen. An activist in land-reform, he organized the first Agricultural Producer's Co-operative in Peking area in 1952. During the Great Leap Forward he was elected first vice-chairman and then chairman of the commune in the early sixties he was deposed from his position but became a brigade leader in 1963. Now, he is the chairman of the Revolutionary Committee of the commune and secretary of its party-committee. In 1969, he was a deputy to the Party Congress. I had three separate sessions with Ying, each lasting around five hours.

Obviously, such a case-study is limited by particularism. This commune is neither a typical nor an average one. But, I hope, my discussions with leading and responsible cadre of higher levels, district, municipal committee, ministries and Research Institute, as also my short visits to a number of communes, both in North and South China have given me a certain perspective. The other limitation is obvious, my sources being entirely Chinese.

The extensive and excellent literature on China by Western scholars have surely, chastened my enthusiasm, and resulted sometimes in reinforcing my bias and perhaps sometimes in better objectivity. But one wonders if it is really possible to approach an experience like that of a Chinese commune, without "previously held views or assumptions".

Finally, there is the limitation of my approach—a non-scholarly and journalistic one. But "today" is the day of the journalists and I am discussing "today".

I have divided the study in three sections for the sake of clarity, but inevitably, because of the linkage of the "struggles" they overlap. Although in discussing class-struggle I have had to introduce generalities and conceptual problems, I have tried by and large to confine the exploration to concrete cases and examples.

II. CLASS-STRUGGLE AND THE STRUGGLE BETWEEN TWO LINES

I shall start with an example, rather common—Comrade Tu Kai (generally called Lao Tu or old Tu) is a responsible member of a production team in Hwang Tu Kang commune. In late 1971, he gave me an example of what they meant by class-struggle :

"One day Comrade Wang Pao-san, in a group-meeting compared his own experience of the old and the new societies. Though he was an able-bodied worker, in the old society he led his life like a beggar. He had no land, no house, no schooling, no shoes and never enough food.[2] Now like his all other class-brothers, the poor and lower middle peasants (emphasis added) he has a house, adequate food, cotton-padded jackets and trousers and even a bicycle. His children go to school and he himself has learned to read and write. Whom should he thank for all his happiness? Chairman Mao and the class-organisation. Chairman Mao, the Red Army and the party liberated the area and we the poor peasants got organised and wrested power from the landlords. Since we got organised we could no longer be exploited. What happens if the soliderity of class-rank is sabotaged? The old bullies and the old monster of exploitation raise their heads. Why? Because they know the art of lining their own pockets and they have better man-power,[3] savings, implements and skill. Poor peasants individually are like peach blossoms in March. They are beautiful to look at and they are red. But one hailstorm and they are lost. They get into debt and become tenants or hire labour. How can the class-rank be consolidated? By being constantly vigilant and by consolidating the collective. If we work for the common good, each one of us prospers. If we place self first, we undermine the collective. Whom does it help? The class-enemies who want to restore the old society. Who should stand up against their evil designs? The poor and lower-middle peasants. By listening to Comrade Wang we understood vividly the teachings of Chairman Mao—there are classes, class-contradictions and class-struggles ; there is the struggle between the socialist road and the capitalist road and there is the danger of capitalist restoration".

The example above may be taken as a simulated attempt at raising class-consciousness through "speak bitterness" meetings, "a far cry from the rural

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[2]A picturesque description of living conditions was given to me by Comrade Ying Wei-chen, Chairman of the Revolutionary Committee. "How did we live? Well, lying on our backs we could count the stars; if we turned sideways we could see our neighbors passing by. The caps we put on our heads were like flower-blossoms with spread-out petals, the shoes we wore had no soles and our clothes were colourful in thousand patches".

[3]Some poor peasants, owing to poverty in the past "got married late and their children are still young. They have a big family but little labour-power. Others due to difficult family conditions at the start have no savings so far, and when they encounter natural calamity and weddings or funerals, they find it hard to cope". Survey of China *Mainland Magazines*, U.S. Consulate General, Hong Kong (No. 403).

struggles of the 1930's, 1940's or early 1950's".[4] Or as an excellent piece for propaganda indoctrination.

However, that may be, in the framework of the example, I shall try to trace the complex nature of the struggle in the commune from land-revolution through collectivization, communization to the Great Proletarian Cultural Revolution and after. Some of the issues that will come up are:

1. The release of the peasant-energy in land revolution happened after and 'as a result of the coming of the Red Army and the Communist leadership;[5]
2. The dialectics of the relationship between the vanguard and the masses in arousing and organising the masses into class and interest based unions (i.e., the Peasants' Association);
3. The importance of mass-struggle in the development of a committed leading group genuine united and linked with the masses[6] and their critical role in continuing the revolution;
4. The shifts in redefinition of class-alliance at different stages of revolution; i.e. land-reform and socialist transformation, and reliance on the reliable majority for predominance,[7] throughout the period;
5. The qualitatively different kind of social-struggle after the take-over of the means of production the paramount importance of relationship among the people in production processes and in that context the bureaucratic and hierarchical versus the democratic and mass-line approach;
6. The ceaseless effort to institutionalize local and participatory mass-organization as a countervailing institution to a top-down authority or command structure;
7. and finally, since theoretically, all authority resides in the masses, the mythical symbiosis of Mao Tse-tung thought, the correct line, and the masses.

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[4]See James R. Townsend, *Political Participation in Communist China* (University of California Press, 1967), p.190.

[5]See Hamza Alavi, *Peasants and Revolution, Russia, China and India* (New York, Monthly Review Press, 1965 edition of the Socialist Register), pp. 261-62.

[6]See Mao Tse-tung, "On the Mass-Line" (June 1, 1943) in the *Political Thought of Mao Tse-tung*, Ed. by Stuart R. Schram, p. 315. Also in *Selected Works*, Vol. III, pp. 117-22.

[7]See Mao Tse-tung, "Rely on the poor peasants and establish their predominance", extracted from "Socialist Upsurge", by Schram, *Ibid*, VII B6, p. 347.

Hwang Tu Kang commune was liberated at the end of 1948 and the Land Revolution was carried out by September 1949. The Red Army held the ring for popular political action i.e., the seizure of power by the local, mass-organisations, the Poor Peasants' Associations, from the local landlords and the gentry.[8] But, why could not the peasant majority seize power before? Because as the Chairman of the Revolutionary Committee of the commune said, the landlord and the State machinery were linked together. Grandmother Lu Fung-chen worked for a landlord. One day she took some coke from the refuse, thrown away by her master. Immediately she was caught and handed over to the police. Her brother was arrested and beaten to death by the police because he had refused to sell his only parcel of land to the landlord. "How could we wrest power from them?" asked Comrade Ying Wei-chen. Peasant energies to be liberated needed the basic security and knowledge that the state-machinery is no longer serving the interest of the local power-holders.[9] The peasant passivity, in the face of age-old oppression and insecurity is not a subjective factor due to "the immaturity, the backwardness, the ignorance, precisely of the poor peasants", but to the material and objective factors, which they know they cannot overcome without "a champion strong and firm enough to assist", and only after "the latter has own political power".[10]

Coming back to the commune, what happened there ? Consequent to liberation by the Red Army a party cadre (one for the whole hsiang or township),[11] came and talked to the poor peasants in Comrade Ying's natural village. He told them that they are the masters of the country, they are numerically superior

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[8]See Jack Gray, *The Two Roads in Authority, Participation and Cultural Change in China*, ed. by Stuart R. Schram, pp. 155-57, for the interesting parallel he draws between land-reform and the Socialist Education Movement of 1964 merging into Cultural Revolution. The basic question, he argues is the means by which collectivism should be reasserted, whether by administrative fiat from above or by popular action from below.

[9]See Mark Selden, *The Yenan Way*, "In the absence of extended military successes, the pre-requisite for creating and preserving a stable base area, it was impossible to energise the peasantry to play an active role in land-revolution and Soviet military and political affairs" (p. 77). With a comparatively stable base area "the land-revolution of 1934/35 was instrumental in peasant support for the guerillas in Northern Shensi". See also Mao Tse-tung, "The Composition of Red Army in the earliest days" (November 1928), cited in *The Political Thought of Mao Tse-tung*, *op.cit.* "Few of the Peasants in the border areas are willing to serve as soldiers. Since the land has been divided up, they have all gone to till it". See Roy Mark Hoffeinz, "The Peasant Movement and Rural Revolution, Chinese Communists in the countryside 1923-27" (Ph.D. dissertation, Harvard University), "Most of them (peasants) would prefer to be passive and inert".

[10]V.I. Lenin, *Selected Works*, Vol. II (Moscow, 1947), p. 647.

[11]Hsiang is the lowest territorial administrative set-up in pre-commune days : state, province/municipal committees like Peking or Sangchow, country-district and hsiang.

to the local landlords and bullies; if they organise themselves, they can overthrow the oppressors",[12] the middle peasants or self-sufficient independent land-holders have also been oppressed by the unjust levies of the landlords and the gentry, they do not exploit others and hence should be allied with;[13] they must analyze the class situation carefully and struggle themselves (class-struggle or world-view) the locus of the struggle being their own organization, the Peasants' Association as the "instrument of action", led not by outsiders, but by them.

In other words in radically transforming a society, the vanguard is essential to lay down the line, to issue the "general call for mobilizing the masses, explain and forge an identity of interest between leaderships' goals and the demand of the vast majority. But it is for the people themselves to organise and launch the struggle at a given place. Since organised activity "cannot be sustained for long or carried forward in the right direction or raised to high level", without a strong leading group, the outside party care unites with the "active elements", in any given community to form a leading group and "relies" on them for mobilising maximum participation of the masses through their own organization.[14]

In Comrade Ying Wei-chen's village the Peasants' Association was formed and he took a leading role in it. He was a farm labourer then in his early twenties.[15] Women also joined in including Grandmother Lu. In fact in the blood-settlement meeting in the village she went up to the platform where the landlords and rich peasants were lined up and charged her old master whether or not he had sent her husband to work for the Japanese as a coolie. This was settling blood-accounts and then came meetings for settling economic accounts and finally redistribution

[12]See Mao Tse-tung, "The Great Union of the Popular Masses", Translated by Schram (1919).

[13]The pragmatic consideration of production-needs in a wartorn economy has, of course, been a basic consideration in this regard. See MaoTse-tung, The general line of Land-Reform Text VII, B3 in the *Political Thought of Mao Tse-tung*, *op.cit.*, pp. 341-42. "The general line of land-reform is to rely on the poor peasants, unite with the middle peasants. Only the poor peasants.... must be the basic force to be relied upon... the poor peasants and farm labourers (70%) must form a solid united front with the middle peasants who account for about 20% of the rural population. Otherwise, the poor peasants... will find themselves isolated and the land-reform will fail".

[14]Mao Tse-tung, On the Mass-line in *The Political Thought of Mao Tse-tung*, *op.cit.*, VI, C3 p. 315.

[15]Compare Mark Selden, *The Yenan Way*, *op. cit.*, pp. 93-94. "For a generation of youth in North Shenshi, participation in land-revolution was the decisive act in breaking the ties that tied them to a decadent and oppressive order and in defining their involvement and leadership in the new society".

of land taking the village as the unit.[16] In classifying the households, the thumb-rule in this village was as follows : a family including children having 30 mou of land per head, landlord; 16 mou per head, rich peasant; 2 mou per head, middle peasant; 0.6 mou per head, poor or lower-middle peasant. Another criterion for the rich peasant was deriving more than 25 per cent of income from exploiting other peoples' labour. What is important to emphasize, although it is commonly known, is that all these classifications and distributions were done through open meetings of the local Peasants' Association thereby providing new opportunities for peasant political action and at the same time throwing up peasant-activists committed to the revolution through actively particpating in it.[17]

From Land-Reform to Collectivization

What happened after land-reform and what were the twists and turns of the struggle ? Comrade Ying talked about four distinct tendencies.

First, only a few months after land-reform the old phenomenon of poor peasants selling their new land or becoming hired labour started reappearing. The poor peasants had land, true, but they lacked animals and implements; they were short of labour-power too (for reasons see Footnote 4).

If natural disaster took place, individually he could not stand up to it.[18] For evidences of this phenomenon one can refer to Ezra Vogel.[19] According to a survey in rural Kwangtung, in 1953, "about 10 per cent of the households were

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16See William Hinton's classic *Fanshen*. For the leaderships' understanding of the importance of peasant-organization in carrying out land-reform, see Keith Buchanan, *The Transformation of the Chinese Earth*, (New York, 1970) and "Rural Development in China, 1949-72 and the Lessons to be Learned from it" by John G. Gurley in *Employment in Developing Countries*, Edger Edwards (ed.), (New York, 1974). "In carrying out land-reform our party did not take the simple and easy way of relying on administrative decrees and of bestowing land on the peasants....For three solid years we applied ourselves to awakening the consciousness of the peasants. Because we had used such a method, the peasant masses stood on their own feet, got themselves organized....and took the reins of government... in the villages firmly into their hands" (Liu Sao-chi).

17See Richard Solomon, "On Activism and Activists", *China Quarterly*, No. 39, July-September 1969.

18See Mark Selden, *The Yenan Way*, "If land ownership had for the most part been equalised and debt largely eliminated, the possession of draught-animals and live-stocks provided the major index of wealth and class-differentiation" (pp. 85-86).

19*Canton under Communism* (New York, 1971), p. 142.

lending money to others and some were even buying land from debtors". Kenneth Walker also cites from primary source some figures about the polarisation:[20]

	Poor Peasants (per household)	Rich Peasants (per household)
Land (in mou)	11.7	34.6
Animals	0.5	2.0
Ploughs	0.3	1.0
Water-wheels	0.0588	0.3

Second, the movement to get organized and the sharp class-contradictions in the framework of individual ownership.

> In the year 1950, we eight poor peasants organised a mutual-aid team. What does it mean? We helped each other with labour and farm implements and animals. For instance my family help yours for two days and yours do for three days. At the end of the month you pay me for one day's labour. Similarly payment for any member's draught animal was based on an agreed work-day system. Thus in essence, the team worked as an aggregate of individuals and not as a group. Some members, for instance, would not do weeding because it would increase their labour cost. Every one tried to rush off to his own field to complete the work.
>
> Nor could we build up a reserve for buying more farm implements or animals and did we need them? How could we solve these contradictions? Chairman Mao had asked us to organise ourselves. We had heard about co-operatives from the old areas in the North....and we formed our own in late 1952...The middle peasants would not join us. They were welcome, but they wanted to wait and see. They had farm-animals and implements, so, why should they? At that time they still *did not suffer from labour shortages* (emphasis added). Some of the poor peasants who had not joined the mutual-aid team or the co-operative were still available for hire.

Again, let me quote from Ezra Vogel, "Poor peasants wanted to join co-operatives with middle peasants (because they possessed more tools). Middle peasants wanted to joint with other middle peasants rather than *share their wealth*

[20]Kenneth Walker, "Collectivisation in Retrospect : The Socialist High Tide of Autumn 1955—Spring 1956", *China Quarterly*, No. 26 (April-June 1966). Source for the Table Agricultural Co-operation in China (Peeking Foreign Language Press), 1956.

with poorer and sometimes less industrious peasants (emphasis added").[21] In Hangchow, Comrade Shiang Kuang-lin, Vice-chairman in charge of production in Evergreen Peoples' Commune told me, "In 1952, there was an acute struggle. The old landlords and middle peasants raised the slogan of freedom of choosing partners. Those with better farm-implements would not join with the poor peasants. They said, rich with the rich, rich with the middle and poor with the poor".

As a consequence, the third problem was reappearance in some villages of the traditional mutual aid on the basis of kinship group with rich peasants dominating (Pien Kung) and the exploitative relationship of work-gang (Chakung) thrown in.[22]

To quote Comrade Ying again,

> Alongside our co-operative, another two were set up in the village. The leadership of those was in the hands of uppermiddle peasants. In one of the two the chairman was the person on whose land I had worked as a hired labour. How could he join hands with me? Our *class origins and class stands* (emphasis added) were different. Due to his class origin he wanted to line his pockets. He and others like him did not work in the field. The poor peasants (joining his co-operative because of kinship ties) worked and got low return for labour. On the other hand the rental fixed for land, farm-implements and farm-animals was high. Instead of working for the co-operative, he and his friends used this time more on side-line occupations and private trade. The co-operative income was distributed on a monthly basis. No reserve was kept nor any stock for the end of the year as safeguarded against bad weather.

Similar examples of exploitative relationship between the prosperous leaders and poorer members are given by Kenneth Walker. Ezra Vogel points out that the rationale for semi-socialist co-operative[23] as in the main an incentive for middle-peasants dictated by production-needs for the reconstruction phase after liberation. True, but as the example shows, as long as private land-ownership is

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[21]See *Canton under Communism, op.cit.*, p. 148. But are the poor peasants or semi-holders intrinsically less industrious ? What are the disincentives? Isn't the unwillingness to share wealth the basic problem?

[22]See Mark Selden, *The Yenan Way, op.cit.*, for the pre-liberation experience in building on traditional mutual aid in a different manner during the later Yenan days (pp. 242-49).

[23]A semi-socialist co operative pools the land but pays a dividend for the land contributed usually 30%, rest of the income being distributed according to amount of labour put in by members. In the collective land no longer remains individually owned, and "collectivized farm-animals and implements are also pooled, though paid for".

recognized and inequality remains, the poor peasants may not have an effective voice in the management of the co-operative. If the leadership's aim is to increase production in the strict economic sense, it is possible to realize the goal by resource-concentration in the hands of the allegedly more skilful and productive middle, uper-middle and rich peasants.[24] On the other hand if the cause of socialist transformation is to be served a new class-alliance has to be forged with the majority, the underprivileged. Further, this has special significance in altering the social relationship from familial and kinship ties to a class-relationship.[25]

Thus the question posed sometimes on the failure of the cadres to bring the poor and middle-peasants together and on the acceleration of collectivisation process in the fall of 1955 and early 1956 instead of using the semi-socialist co-operative as a comparatively long time-span bridge between individual farming and ultimate collectivization, can be answered. If in a period of siege and war a call could be given for those who have ploughs or animals to give those and those who have labour to give labour, so that the seasons be not violated, and a broad consensus gained on such a call,[26] in a period when order has been restored and hence security, the independent landowners self-sufficient and surplus will generally form a vested interest and not actively support the transition to socialist agriculture or what Ezra Vogel calls "sharing their prosperity" with the poorer members of the community. In this context, then Mao's "creative use of Marxist analysis" as the Chinese said, by differentiating between different section of middle peasantry can be better understood.[27] That is, as Hamza Alavi says, "the subtle dialectic understanding of the respective role of the middle and poor peasants". The middle peasants had to be united with to break the local power-structure, the principal enemy, but precisely, as they are not a revolutionary class, the revolution is to be carried forward by the "potentially the more revolutionary section of the peasantry", the poor peasants. When Ezra Vogel cites from numerous primary sources, the "appeal to poor peasants" in the August '55 speed up, and the policy of pressuring the middle-peasants",[28] he is obviously

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[24]See P. Bernstein, "Problem of Village Leadership after Land Reform". He quotes : "Rich peasant economy will have better productive forces at its disposal than small peasant economy... better conditions for improving implements, raising technology, using fertilizer timely", as a view of some Chinese economists.

[25]See Ezra Vogel, "From Friendship to Comradeship : The Change in Personal Relationships in China", *China Quarterly*, No. 21 (January-March, 1965).

[26]See Mark Selden, *The Yenan Way*, *op.cit.*

[27]See Mao Tse-tung, *The Question of Agricultural Co-operativisation*, July 31, 1955 (Peking Foreign Language Press, 1956).

[28]*Canton under Communism*, *op.cit.*, (pp. 149-53). In assessing land-value for interest for instance "the land of comfortable households would be calculated at 85% of its value, ordinary peasants at 95% and that of poor peasants at 100% or more".

right. The question, as far as social goal was concerned, was whom to serve and whose interest had an identity with the revolutionary goal. If we accept Mao's analysis of the classes in rural China and his reemphasis on alliance among the peasants (19 per cent), semi-holders (16 per cent), share-croppers (19 per cent) and lower middle peasants, independent but with annual deficit (15 per cent),[29] we can see that they comprise around 70 per cent of the peasant populace.[30] Levelling down the prosperity of the very few (the upper-middle and rich peasants) and collective security, were naturally to the interest of the poor majority and thus there is an identity of interest between the new class-alliance and the leaderships goal of socialization. As Comrade Ying said, they had no particular attachment to land, perhaps because they had no land before. Their problem, after land-reform, was one of livelihood and not of ownership of land which because of circumstances they could not hold on to without joining with others. Whether one calls this democratic being responsive to the majority, or coercive because of the "policy of pressuring the middle peasants" and as such deleterious to production,[31] the important point there is the shifting coalition of leadership with a new class-controlled community organization not by coercion but through positive support of the majority. Because, as Mao says, "the rural semi-proletariat are not so insistent on private ownership of the means of production in small peasant holdings".

To sum up then, if the vanguard or what Lenin calls the champion is to bring to the masses the new world-view of class-struggle, they have also to forge identity with a shifting class coalition at different stages of the struggle. Instead of doing the revolution for the people, the people must do the revolution themselves. The instrument of action is the local popular organization and the leading group embedded in the organization and growing out of struggle. The vanguards'role is not "to proceed by orders" but to unite with the local leading group and heighten their consciousness.

That brings me to the fourth and a very crucial problem raised by Comrade Ying—the problems of local cadres. Since Bernstein has given a most excellent

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[29]See *The Political Thought of Mao Tse-tung* (1969). An analysis of the various classes; the Chinese peasantry and their attitude towards revolution (IV. B. P. 241). The percentage breakdown has been taken from Hamza Alavi (*op.cit.*).

[30]In the production brigade, where Comrade Ying lives now, the classification at the time of land-reform was that out of 373 households, there, 30 were of big and small landlords, 10 of rich peasants and 48 of middle peasants, the rest being lower-middle and poor peasants.

[31]The same debate went on in China too. See Mao's reference to the Comrades who think that "unless the old middle peasants take part, the problem of the Co-opratives; shortage of the means of production cannot be solved" (extracted from Socialist Upsurge in the Countryside in *The Political Thought of Mao Tse-tung, op.cit.*, p. 347).

account of it,[32] I shall only refer to what Richard Solomon cites as Li Tzuhsi thinking.[33] "Li Tzu-hsi was a poverty-stricken peasant who in the fierce struggles of land-reform displayed a (spirit of) daring and activism...But after the land reform, he was given a piece of land, a house...took a wife who bore him a son... and thought that the enemy had been defeated that 'all the world was at peace and everything was just fine'. This political lethargy was a problem, all the more serious because of the importance of rural leaders in the Maoist view as the "informal intermediary between the higher level leadership and the village... actively committed to the community ties and action". The points to note here are first, the corrosion of the local peasants' association, and solidarity thereof, by a return to individual farming. As Townsend points out, "Peasants sometimes had a significant control over the election and removal of leaders...and peasant meetings were generally open to expression of popular opinion". In the absence of local community organization, the local government cadre, though coming up in the main from Peasants' Association leadership, became less responsive to the village-constituency and more a part of the state bureaucracy.

With the co-operatives as local production-cum-community organization, theoretically at least, the model regulations "provided for total membership participation" in policy meetings or "delegate participation at the ratio of one representative for every ten members" and thus made the cadre respect the whishes of the masses.

Second, as Bernstein points out, the problem of authoritarianism or commandism in rural cadres, sometimes causing passive resistance and discontent among the masses, is viewed by Mao as basically a function of "bureaucratic autonomy" of a vertical structure at higher level, and of "business like" or functionally specific view-points of higher level administrative cadre. For Mao, the answer at the time of collectivization was salvaging the rural cadres through careful education campaigns, defining the central task, i.e., collectivization, and relating other task to that; letting local leaders mobilize the masses and making the cadre responsive to the popular needs through local popular organization, in this case the Agricultural Producers' Co-operative and reactivated Peasants' Association. But what does "bureaucratic style" of the middle or higher level leadership mean vis-a-vis the local community? Comrade Ying gave an example :

> In 1960, the city of Peking ran short of vegetables. Liu Ren, the then vice-mayor of Peking Municipal Committee sent a directive to grow

[32]See Thomas P. Bernstein, "Problem of Village Leadership after Land-Reform", *China Quarterly.*

[33]*Op.cit.*

> vegetables only and no foodgrain. This was a mistake. Vegetables need much more care than foodgrains and we were short of labour power. The result was that per unit yield of vegetable fell. We discussed the situation and collected the opinion of the broad-masses. Our consensus was that the best available use of manpower and land was to grow two crops of vegetables and one crop of maize. But Lin Ren persisted. He told me 'You are the chairman; as you don't agree with us, you will be made vice-chairman'....In 1962 Lin Ren personally came to the commnue. (On hearing about the production plan : two crops of vegetables and one of grain, he got enraged). [He] was in a position of authority and deposed me....The broad masses were dissatisfied. Only one year afterward in 1963, [they] reelected me as the leader of our brigade...what was Liu Ren's mistake? Not relying on the masses and not taking cognizance of the objective situation.

In Maoist terminology, we can rephrase the fault of such leadership as "proceeding by orders and constraints", not going down and uniting with the leadership in the local community, and working with them in obtaining positive support for any work.

Contrasted with that is the democratic style. Two young cadres of the commune Shang Pao-hai and Niu Chin-song in talking about the chairman said, "Before we get up in the morning, Comrade Ing has already completed sweeping the office-yard and other chores. He spends three days a week in production team, working with them (in production)".[34] Or the case of Fang ho-ming, the 65-year old veteran of the Long March and now a vice-chairman of the Revolutionary Commitee with 200 work-days a year to his credit in the No. 5 production brigade of Liu Ling Peoples' Commune.[35] Then of course there is the famous example of the model Ch'en Yung-Khei, leader of Tachoi brigade, vice-premier and member of the Central Committee of Chinese Communist Party.

Implicit in the example above is not only a question of style or an organizational technique,[36] but also the vision of a local organization-structure highly participatory and largely self-governing putting out of commission in ever-

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[34]See A.Z. M. Obaidullah Khan, "Class-Struggle in the Yellow Sand-Hill Commune", *China Quarterly*, July-September, 1972.

[35]See *Peking Review*, January 3, 1975.

[36]See in this context Mao's exposition of the mass-line in *The Political Thought of Mao Tse-tung*, *op.cit.*, pp. 316-17 and also p. 31. In Mao's talks with his nephew (July 1944), he also describes the mass-line as related "to the question of methodology", but it is predicated on the ideal of revolutionaries, "who whole-heartedly serve the majority of the people" (From Mao Tse-tung unrehearsed translate by Schram : Text 15).

increassing measure the "hierarchical apparatus of state" and of the "critical role" of leaders in these organization in continuing the revolution.[37]

Hence, I repeat, the importance of class-solidarity and class-consciousness in the second stage of struggle for socialization. Let me give examples—from our commune in its early co-operative days,

> It was only three years after liberation. We were not well off. Between harvests some households were short of food. The co-operative had very little fund. We called a meeting and compared our present difficulties with the past. The State in the meanwhile gave us some loan to purchase cart and fertilizers. And we realized that our present difficulty was of a temporary nature. Our ideas and thinking got unified.[38]

The comparison of the past with the present, here, had a definite role in strengthening the class solidarity, as reversion to individual farming might slide them back into old bitter days : while at the level of the superstructure, the support of the State to the co-operative helped in raising the group-consciousness and commitment to the general line and policy. In 1953, for instance, debate came up in this co-operative whether to take in poor peasant members first or the middle peasants who had both animals and implements in the co-operatives. The consensus, reached after recalling the past again, was to give preference to the poor peasants being "bitter melons grown on the same vine". In this context of the struggle for evolving a new social ethic, that of a communal society rather than an individualist society, the importance of mass-meeting and campaign for achieving unity at a higher level of consciousness or to use another terminology of group dynamics and group pressure is paramount, particularly in ensuring allegiance of the individual to the group. Again an example from the early period of co-operativization.

Hua Chun-hai, a poor peasant and member of the co-operative, was good at sinking wells. In April, 1953, there was a drought and many people wanted to sink wells on their lands. Hwa was tempted by a foreman, outside the co-operative to join his team. This work would give him 5 yuan a day. So he opted out of the co-operative. His elder brother however continued with the co-operative and at the end of the year he received his share apart from the monthly advance of 200 yuan in cash and wheat, maize and soyabean enough to feed his family more than year and a half. The younger brother worked for 50 days and earned 250 yuan. Since he had opted out, he did not get any share of the co-operatives'

[37]See Jack Grayand Cavendish, *Chinese Communism in Crisis* (1968).

[38]According to Ying, at this time they fixed 5% of the land to be used as private plots by members to overcome the problems mentioned above.

annual settlement. By the time of spring festival he ran short of food. He went to his brother but was refused. Then he came to the co-operative and it helped him with food-grains from its reserve. He requested for rejoining the co-operative and the leadership told him, "Well, you can join, but the members want to learn from your experience. They want to know whether working alone was superior to working together". He agreed and a meeting was called. Hwa then gave the full story, how he was misled, how many days he worked and how he ended up as a lonely beggar without even a single class-brother to support him and how the collective which he had spurned helped him. Such stories with both positive and negative examples are numerous, the efforts being assertion of the long-term superiority of co-operative living to ephemeral affluence of going alone. So much for the struggle during collectivisation.

Birth of the Commune

Let us now look at the new "social struggle", after basically completing the task of socialist ownership, the period of the commune, the bitter years, Cultural Revolution and after till 1972. I shall first describe briefly the birth of the commune, its organization on the old basis of large collectives and earlier village co-operatives. This is how the chairman of the Revolutionary Committee described it :

> By 1956, all the co-operatives in our hsiang had amalgamated into four Ta-she or large collectives. Even these units could not tackle the problems posed by road or water-conservancy works for instance...our area is basically a vegetable growing area : the main task being supplying vegetables to Peking city. But without a net-work of big enough roads we could use only small carts....Building roads meant having a unified plan for the whole hsiang, as the main artery would cut across all four co-operatives. Take the case of drainage channels. We have dug now five major channels to draw out flood-water during heavy rains. But we could not dig them earlier (since the land of two or more co-operatives was involved). The same was the case with the big irrigation canal....We needed unified fund for investing in electrifying the tubewells (in 1959 the commune drew 20 kilometers of high tension and 131 kilometer of low tension line from out of their own fund and with their own technicians supported by the State with the materials at a preferential cost and with training of the electricity-crew). Besides we needed to mobilise the manpower for such works which could be achieved through a unified plan with mutual exchange of skill and manpower among the co-operatives. Further... a tractor was too expensive for a co-operative to finance on its own. Nor could we set up rural industries...without side-line occupation, we

could not provide employment for our members year-round,...We felt the need for some reform in the organisational structure. In the summer of 1958 Chairman Mao visited an enlarged co-operative in Sui-ping country in Honan where agriculture had been combined with commerce and industry and production with local government. He approved. In early August we came to learn about it and went to the district leadership for the details about the new organisation. We held meetings and discussed the problems of public works, health, education, etc. field by field. Then we went back to our co-operatives, held group-meetings with the members for ten days. Finally the overwhelming majority of them supported the setting up of the new commune.[39] There were dissenters, but very few. The poor and lower-middle peasants were solidly behind it. That was in the last week of August, time for planting cabbages; to celebrate we planted 10,000 mous.[40] On the 28th August people from all over the commune came to attend the mass-rally for the setting up of the commune. Marching to the beats of gongs and drums they assembled in a square. Each group prepared its own performance. Young people came in their best dress. This was the biggest festival since liberation. 11,000 people attended the rally.

Re-organizing the four-co-operatives into the new structure was not difficult. One collective, quite large had four production centres under it. These became four brigades. Production-groups (the old small village co-operative) under the centres became the teams. Another collective with scattered households was divided into five brigades. The other two were converted into two brigades. 106 production teams remained as before.

There were problems with distribution of existing assets, very few though. Like farm machinery or co-operative workshop among the brigades and between brigades and the Commune. The usual mode for settlement were discussion-meetings and consensus.

With the amalgamation of the hsiang (township) government and the production-organization, the old local government cadres were distributed between

[39]From the description above "one need not be completely sceptical about the official explanation that communes chose from examples of the groups of collectives in Honan and elsewhere which were taken up in the whole of China after Mao Tse-tung had approved them". Jack Gray, *op.cit.* See Hoffenz, "Rural Administration in Communist China", *China Quarterly*, No. 11, July-September, 1962.

[40]Mobilization, broad participation (manipulated or spontaneous) ideological education, awarness of class-distinction and campaign for production are lined in a chain. See an interesting parallel, the 1953/54 local government elections in *Political Participation in Communist China*, Townsend, *op.cit.*, pp. 135-36.

the brigades and the commune, while the old production centres of the four collectives elected temporary cadres for the brigades and the commune. In 1959 there were elections at all three levels, team, brigade and commune.[41]

Briefly, the production organizations and the largest local government body got merged in the new unit, small enough ideally, for effective participatory democracy, and large enough for building the road and the irrigation canal that Comrade Ying talked about. In concrete terms, the commune in late 1958 and 1959 mobilized the manpower for levelling sandy hills and planting trees, "painting the ointment and piercing the needle" as it were, and in bringing in a canal from the nearby river. Electric lines were drawn (with state support) for power to deep-wells. The only blacksmith shop or workshop was upgraded into a Farm tools repairs and manufacturing shop with the help of some shapers and drillers given by the State. (Today, at the commune level there are four industries beside the one above: a hardware manufacturing unit, a workshop for making harness tools for horses and horse-carts, a brick-kiln and an agriculture machinery station with more than sixty lorries and tractors.) Three tractors, previously run by outsiders were handed over to the commune as machines they could depend upon and manage themselves. (Today there are 73 tractors of which 50 are hand-tractors.) The first junior middle school was set up. (Today, there are three middle and sixteen primary schools.) Spare time schools were set upto train peasant-technicians, while some old handicraft workers were sent to Peking for training. Shops or commercial centres proliferated for supplying both production and consumer goods to commune members. (There are now fifty such shops.) Ideally, the commune was to take care of the public health needs, but it was only after 1967, that the commune had its 20-bed hospital with clinics in every brigade and bare-foot doctors in the teams. (Before 1967 there was hardly one medical personnel for every one thousand people: today there is one for every one hundred.) Then, the militia was being built up : the utopia of a self-governing local community capable of defending itself. The ideal then was of a local community run by peasant cadres for the peasants, modernizing themselves and learning in the process the state supporting such development with technical and logistic support. It is, as we will see in the discussion on struggle for production and scientific experiment, a basic policy question, and to avoid repetition, I shall not discuss the debate here. From the class-struggle point, the important point is the vision of a local communal organization run by themselves, and not by outside urban bureaucrats and technicians.

[41]The election processes in the commune are interesting. I have dwelt with it briefly and rather sketchily while describing the formation of post cultural revolution Revolutionary Committees.

Two other points (again much discussed by scholars), need mention before we go on to the retreat from this vision in the difficult years of late 1959 to 1961, in some cases 1962. In this commune, even during the collectivization days, the unit of account[42] was already the production centres, i.e.,... the brigades in some cases of the new structure. This created problems in late 1956 when the co-operative suffered from flood and water logging, and again in the drought year of 1960. Some said, "Our production team is richer, has better soil and man-power. Why should we subsidize the poorer ones "? This levelling down of the more prosperous village for benefitting the backward village by combining the two in one unit caused dissatisfaction and in early 1961 production team was reinstated as the unit responsible for both day-to-day production and distribution of income.[43] Further, in this commune also a percentage of foodgrains for consumption of members was given freely without relation to the work done. This was reversed in 1961.

Second, there was further restriction in late 1958, on 5 per cent arable land to be used as private-plots. The argument that Comrade Ying gave is similar to what Kenneth Walker cites in his book on *Planning in Chinese Agriculture*. Though the size of the private plot was same, "The degree of independence provided by private plots" for the upper middle peasants was far greater than for the poor peasants: an important reason being the ownership of cows, pigs, fruit trees and small farm-implements.[44] Their concentration as Jack Gray says, upon individual enterprise and private profit is a mortal drain on collective resources and must be stopped. In other words, private plot, vestiges of the old system, even if pragmatically necessary at the present stage of productivity of the collective, must not corrode the "absolute predominance of the collective economy".[45]

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[42]This means that the income of the entire unit is pooled for distribution to all the members according to work.

[43]I have discussed this problem partly in the next section. See Kenneth Walker, *Planning in Chinese Agriculture*, (Chicago, 1965) : pp. 18-19. "By building upon the existing structure (the small village-cooperative, the collective and the commune)... it was easy to retain the formal structure of the commune, while making the actual unit of profit and loss, ownership, day-to-day planning and distribution the farmer collective or even co-operative". See also Jack Gray, Chinese Communism in Crisis. "The original Unitary commune proved to be on too large a scale to conduct day-to-day farming which reverted to the original small collective; this was too small for effective agricultural planning and such planning was left to the brigade. Local water-conservancy, communications, education... industry were operated on the more adequate commune scale. The main advantage of this system was its flexibility, and it is this very fact which makes the communes so difficult to study".

[44]See Kenneth Walker, *Planning in Chinese Agriculture*, *op.cit.*, pp. 33-41. See Tables VII, VIII and IX cited by Lim for primary source.

[45]See Article 7, 1975, Constitution of the People's Republic of China.

Bitter Years and the Period of Reversal

Now, let us look at what happened during the bitter years and the period of reversal (1950-61).

1. In 1960, the three tractors which the commune managed since 1958 September were recentralized. The bureaucracy of the tractor-station not only corroded the leadership of the commune leaders but could literally hold the "peasants at ransom".[46] Benedict Stavis cites [47] a report on this change in management of tractors in a collective in Lank' ou county:

If there is food but no wine the tractor does not move;
If there is wine and no food, the tractors run out of order;
If there are both wine and food, the tractor flies.
A bureaucracy, owning nothing but enjoying everything.

2. The repair-shop, though not closed down, did not receive any more state support, while the spare-time schools withered. The line taken was that industrial development depend "on a small number of people who have scientific and technical knowledge". So the State will selectively set up enterprises manned by competent people and run "independently of the local governments".

3. Rural production was to be stimulated by extending private plots, fixing responsibility on individual households rather than on the team, opening free markets for selling of privately produced goods and encouraging private sideline occupations and handicrafts. This policy, commonly known as three freedoms and one guarantee, placed premium on the more skilled and more prosperous, the old middle and rich peasants. The "household management and responsibility" corroded the solidarity of the class-organization in the production-team. The poor peasants, without such organization and the security of the collective, followed in some cases the new reference group, the upper-middle peasants. This situation was quite grave in a poor brigade of the commune. "Members would take the tobacco grown on their private plots to the free-market and sell at exorbitant prices. Work on the collective was ignored. The question was dominance of 5 per cent over the 95 per cent, of private sector over the collective and whom it serves.

4. A related and important problem was that some basic level cadre became passive, while some others colluded with the rising private-sector operators. The higher level leadership of Peking Municipal Committee on the other hand, for short-term goals of production relied more on the skilled middle peasants

[46]See Jack Gray, *The Two Roads*, *op.cit.*,p. 143, citing K'ang Sheng on his report on Soviet Tractor station.

[47]*Op.cit.*

rather than on the activists. Example: out of 10 collective pig breeding farms, 8 were disbanded. In some production teams "rich peasants usurped the leadership". Collectives' vegetables instead of being sold to the State were sold on free markets.

The struggle, then, was to stop the growth of a new class of bureaucrat-technocrats and the old class of private-sector operators, the method, for Mao, being organizing the poor majority at the local level and letting them discipline the bad elements as well as the erring rural cadre.

If that was the spirit of the "Socialist Education Movement" in 1964, what happened in Hwang Tu-kang was quite different. According to Comrade Ying:

A work-team was sent from peking in middle 1964. They said "whoever (cadre) refused to follow the official line would be deposed". Instead of working with the poor peasants to revitalize the old class organization in the villages, the emphasis was on disciplining the rural cadre. Rather than soliciting mass-opinion and letting the people openly air their views the method was of secret enquiry. Thus, "what the team did was to create division among the people. In one case, the team even tried to bribe the group by distributing the reserve fund among the members".

However propagandist the above may appear, one approach was basically an administrative one for stemming societal deterioration like corruption, while Mao viewed the problem as political, "Collusion between those who have an interest in restoring capitalism and party members in authority at all levels".[48] For Mao (23 point directive of January 1965) "whether those land-lords etc. who have worked honestly and done no evil...should have their labels taken off...shall be decided by the masses. . . .Whether it will be more advantageous for a production brigade to contain more than thirty households should be decided by the masses. . . .None of this must be decided by the higher level.[49]

The struggle was to be carried out by the local community relying on the Poor Peasants' Association rather than "through arrangements from above".

Great Proletarian Cultural Revolution

The above brings us to the Great Proletarian Cultural Revolution. The revolution reached this commune in late November 1966. "We started studying the 16 point charter and other documents. . . .What was the task? To grasp

[48]Jack Gray, "The Two Roads" in *Authority, Participation and Cultural Change in China*, edited by Schram (Cambridge, 1973), p.153.

[49]*Ibid.*

revolution and promote production. What were the slogans? Hit the counter-revolutionaries and capitalist roaders; criticize all reactionary ideas; put public good first: fight obscurantism; work scientifically and rely on the revolutionary masses". Without going into details, there were a lot of confusion and even factional struggle.[50]

> Numerous mass-organisations sprang up. The cadres of the brigade and team stood aside. The party branches were also in disarray. The masses were confused too. Some bad elements tried to take advantage of this. Some even proved to be ex-kuomintang officer like Ma Fu-Kwan. . . .He usurped the leadership of a production team...(and) sabotaged production. Forty mou of standing maize-crop went bad (because of his negligence).

There were other leaders of mass-organizations "who did not want any reserve fund for the collective" and who gave loans to people without control and yet others "who did not shrink from terrorism and mean slander to spread dissension among class-rank. Power was taken from Comrade Ying also, then the brigade leader, by some representatives of mass-organizations in the brigade. "They said, 'we have come to take over power from you'. I said, 'what power'? They answered 'the rubber stamp of the brigade'. I said, 'I want the opinion of the broad masses. . . . the chairmen of the Poor and Lower-Middle Peasants' Associations'. . . They went away and came back with seven chairmen. I asked them what should I do. . . They were confused. They had heard about seizure of power but from whom they did not know. They said, if they want, you can hand over power, temporarily". Comrade Ying was criticized later by these organizations and was sent to take part in physical labour with the label of "counter-revolutionary" hung around his neck.

In March 1967, the P.L.A. came, and in action strikingly parallel to the land revolution, helped reactivate the Poor Peasants' Association. In the daytime they waged struggle "for production, and in the evenings helped up studying Mao Tse-tung thought, and understanding the issues involved. . . .Everyone was involved. This was direct action. . . Errors, sometimes very grave were committed. But by mass participation and P.L.A. support. . . the situation became clearer and the class-stand. . . Some brigades by November 1967, started reorganising their committees, now called, Revolutionary Committees" the Poor Peasants' Committee being the 'back-bone' in that. On December 22, 1967 the Commune Revolutionary Committee was set up. The P.L.A. supervised the election (in the Chinese and not in the Western sense) of the commune cadres.

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[50]For a detailed account of politics during Cultural Revolution, see A.Z. M. Obaidullah Khan, "Class Struggle in the Yellow Sand-Hills", *China Quarterly*, July-September, 1972.

Briefly, (although this is another story) from the brigades where the committees had already been formed came their representatives directly elected by the broad masses of the teams (minus of course the four categories without political rights). From other brigades came the representatives of mass-organizations of teams under those brigades. They sat together and prepared a panel of names. They went back to their brigades and teams with the names. After consulting members of brigades and teams, they finalised an agreed list. To clarify let me quote again,

> The deputies directly elected to the brigade congress by members of the teams discuss among themselves and say, select 10 tentative names for the brigade Revolutionary Committee. The deputies then take the names back to their teams or constituencies for discussion with their electors. Some teams may disagree with some names or add a few more. The names added or not supported by some teams are then discussed by brigade congress and its election group. They analyse the mass-support of the individual candidates in the aggregate list as also the area-wise representation and the three-in-one representation.[51] The deputies then take these names back again and explain the points of view of other teams to their own teams, narrow down the differences and a final agreed list is arrived at. The process is repeated at the commune level, the deputy to the commune congress being elected by deputies to brigade congresses. There is a lot of back-and-forth consultation and, unlike before, leading and responsible cadre at each level are not nominated by higher echelon of state-organ. The election of Chairman of Commune Revolutionary Committee has, however, to be approved by the next higher authority, the District 'Leadership'.

The points that I want to emphasize are: First the importance of mass organizations, particularly, poor peasants' committees as countervailing institutions to the organs of power of the commune or the brigade. Ideally or theoretically, "they supervise the work of the revolutionary committee and the leading cadres. In the election of cadres, these groups play the most important role. Similarly with formulation of production plans at various levels, these committees and groups are consulted first. They organize political night schools for the study of Marxism, Leninism and Mao-Tse-tung thought and give the lead in physical labour". Leading members of these committees and groups with those of youth League and Womens' Associations are represented in the organs of power at the brigade and the Commune-level. Fifty nine per cent of the members of the

[51] The three-in-one combination, in simple terms, means a combination of the old, middle-aged and the young, of men and women, workers and peasants, old cadres and the militia.

Revolutionary Committee are representatives of mass organizations. The percentage of old cadres will be around 27 per cent, the rest being representatives of local militia (not P.L.A.) who overlap with the youth League also. Whether the Poor Peasants' Committees have become paper-organizations (to be activated by the top leadership for campaigns again) or whether the representatives of mass-organizations in the rural organs of power have been sent down to production front while the cadres are running the show are difficult questions to answer. We simply do not know enough.[52] But, this attempt at institutional reorganization at the country-side is basically to keep the leadership in the community responsible and responsive to the masses. It is further bolstered by the insistence that cadres of the commune or brigade committee must take part in production at least for one third of the time. Not only the dividing line between cadres and ordinary members is to be blurred, but the cadres' "Leadership" position is dependent more upon being an advanced element in the organization both on the production front and in socialist consciousness i.e., putting common good first before self rather than on status in a hierarchy.

S cond, the attack on authority during the Cultural Revolution in this commune. Again, in summary, the concept of "authority" is to be replaced by the "dictatorship of the proletariat", a concept that postulates an organization of the masses, imbued with "proletarian consciousness". But, another facet of this phenomenon is the thought of Mao Tse-tung. One can even say that all organization is subordinate to his charisma and all authority flows from his thought. The excessive expression of this cult, perhaps, may have arisen from expediency and will be subdued as it has already been to some extent, but what are the thoughts? Serve the People or in Memory of Norman Bethune both eulogising sacrifice for the common good and putting people before self and "the Foolish old Man removing the Mountains", an exhortation for a fatalist peasantry to conquer nature, self-reliance. Or the four philosophical essays on the ubiquitousness of struggle, of knowing and doing, of idealizing labour and increasing confidence in the so-called ignorants' initiative to improvise to innovate and of debunking the distinction between the wise and the ignorant, which is more a question of opportunity than of inheritability.

Third, the insistent reference by Comrade Ying to liberating philosophy (i.e., Marxism, Leninism and Mao Tse-tung thought) from "the superstition that these are beyond the comprehension of the illiterate masses". If the commune has been an institution for exploding the mystery of technology by bringing town and technology to the villages and letting the masses learn to master it, the Cultural

[52]See Marianne Bastid, "Economic Decision-making in Authority Participation and Cultural Change in China", edited by Scharam, for a different view.

Revolution could be viewed with all its other ramification as an attempt at democratising revolutionary theory and philosophy, sometimes perhaps to rather ludicrous extent. If access to knowledge of the few can create the class of "wise and the ignorant", the elite leadership through its control of theory and doctrine can become paternalistic and the broad masses passive. Mao's argument is that the line between such doctrinnaire paternalism and fascism can easily be crossed. So, let there be peasant worker theoreticians, and let the knowledge base expand. Mao's empirical theory of knowledge and the unity of knowing and doing can be questioned by scholars.[53] But its idealization of labour-function—and the implication that mass-activity, being the largest aggregate of concrete experience, is the reliable and dynamic source of knowledge—do indeed give increased confidence to the poor peasantry and release new creative enthusiasm and energy. Skill and expertise are important, but that must be fundamentally linked with the collective activity.

And, finally, the immersion of the individual in the collective. Let me quote from a young girl working in the production team I visited.

> I graduated from middle-school in 1966. I belong to a poor peasants' family. . . and I would be working in the broad masses. So why should I need to remould my thoughts and ideas?. . . In my squad I worked hard and then in the evening propagated Chairman Mao's teachings. Then I heard some veteran poor peasants say, 'Young Liu works hard, but she is not one of us'. I felt unhappy and requested the leader of our team to transfer me to another squad. At this the leading poor and lower middle peasants called on me one evening. I told them how I felt. Then the team leader told me, 'Alright, you work hard, even in your free time to promote production. But is that enough?' This made me think. I worked hard but why? What prompted the poor and lower middle peasants to wage the struggle for production. Their wish to seek new glories for the collective. From their experience they know what miserable lives they lead in the old society. So they want to consolidate the collective, the new society. Their enthusiasm for socialism is positive and spontaneous. Mine, based on an individual motive and a negative factor: the fear of criticism if I lagged behind.

The basic question as Comrade Ying told me is that of attitude. Love for the collective is the new spirit. "This is what we mean when we say "fight self-interest: put public good first". Ideally, there is a powerful drive in the

[53]See Benjamin I. Schwartz, *A Personal View of Some Thoughts of Mao Tse-tung in Ideology and Participation in Contemporary China*, Chalmers Johnson ed., pp. 352-72,

countryside to minimize individualism and increasingly to identify the man with the Society. With the gradual break-up of extended family-structure, the effective social relationships are to become increasingly moral and idoeological. The personal elements in life are to be reduced to their essential moral dimension.

One could almost say as Alberto Moravia does, "The moral category of goodness is the proletariat; of evil, the bourgeoisie. Consequently, the class-struggle in China today is the struggle against evil. Class is not something outside or around man, but inside him. Class is the eternal diabolical temptation against which an eternal struggle is necessary".[54]

Thus even a poor peasant can get class-tainted. Old ideas and vestiges of old system remain. There is the danger of both societal and individual deterioration and hence the need for continuous struggle, criticism and class-solidarity.[55]

To sum up, then, the concept of class, during the period of socialist-transition, becomes more an internal than an external one. While working in a field, a woman commune-member found some vegetables covered by earth of a newly dug ditch. In her freetime she uncovered the vegetables and handed these over to her team. A study-meeting was held on the spot. The quantity of vegetables was small, but the important living example for study was who comes first, the individual or the collective.

The organizational framework for raising such socialist consciousness is the class-controlled mass-organization like Peasants' Association or the Youth League, the methods being group-study of living experiences, emulation through both positive and negative examples, speak-bitterness meeting and mass participation in decisions affecting day-to-day life. Ideally, such organizations should keep a constant vigil on the administrative infrastructure of work-organizations, i.e., the Revolutionary Committees of Communes or Brigades. Peasants' Associations, so active in land-reform, or again in early 1967 during Cultural Revolution (the December 15 directive clearly stipulated that the "organ of authority" for leading the revolution will be poor and lower-middle peasants' Committees

[54]See *The Red Book and the Great Wall* (New York, 1968), p. 63.

[55]For a recent discussion on the various implications of the struggle, i.e., the existence of private plots; two kinds of ownership, by the whole people;concomitant existence of bourgeoisie rights and the question of leadership, that is, the question of ownership by which class, not just in name but in reality; the reactions exerted on the system of ownership by the relations between men and the form of distribution and on the base by the super-structure, see Chang Chun-chiao, "On Exercising All-round Dictatorship over the Bourgeoisie" in *Peking Review*, No. 14, April 4, 1975. See also Yao Wen-yuan, "On the Social Implications of the Lin Piao Anti-Party Clique", *Peking Review*, No. 10, March 7, 1975.

at the village-level) have tended to become passive in periods of consolidation. Linking the local production plan with such organizations, their leadership in school-affairs and other activities particularly in organizing study-meetings, physical labour, and their representation in Revolutionary Committees at brigade commune, district and municipal[56] level are some of the steps taken during and after the Cultural Revolution to institutionalize popular participation in state and party affairs. How far this participation is manipulative or spontaneous is arguable. But if we remember the irreducible vanguard concept in socialist participation, the most important questions really are the interaction between vanguard and the masses and elicitation of positive popular support for general line or revolutionary goal. Hence, the importance of local communal leadership[57] as the link between revolution and the masses, their class-reliability, and ideological commitment developed through different stages of the struggle.

[56]The percentage-wise break-up of representation in Peking Municipal Committee is as follows: Workers' and Peasants' Representatives 38%, representatives of revolutionary youth from schools and colleges 19.4%, representatives of teachers, doctors and cultural workers 7%, representatives of street committees (the lowest administrative unit in urban areas) 4%, old cadres 13% and P.L.A. 17.6%.

[57]The call on February 1967, to cherish local cadres, stating also that production-team cadre and in most part, brigade cadre being themselves engaged in production are not "people in authority taking the capitalist road", can be partly explained by Maoist concern of salvaging the rural cadre by supervising from below and educating from above.

Cost Inflation in Bangladesh Tea Industry, 1967-75

by

NUIMUDDIN CHOWDHURY*

I. INTRODUCTION

It is probably incontestable that the general price and cost structures of Bangladesh economy as a whole have gone up substantially since the liberation. The severe post-liberation internal inflation [2,p. 246],[1] probably aggravated by two major devaluations, and the substantial inflation in international prices in the wake of the oil-crisis are, *inter alia*, the major contributors to a rather sharp rise in the over-all cost structure in the economy. In this context tea being an important export item, the cost economics of the tea industry should be the focus of a micro-level study. There is important reason why a study of unit cost of individual gardens may be of policy- interest. It can be argued that, assuming the tea producers to be profit-maximisers, a rise in average costs will lead to an increase in the supply price of tea and, given the relative demand for the output of different estates, to an increase in average revenue therefrom. If the market is competitive, a given increase in average cost will lead to the same increase in average revenue for all enterprises irrespective of size. A study of garden-wise average costs and revenue will permit a test of a hypothesis about a systematic relation between size and how much of the increases in average costs are passed on in terms of higher supply prices.

A micro-cost study has the merit of throwing up economically unviable units, with abnormally high unit cost when due account is made for all relevant factors,

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[1]Bose's paper goes only upto 1972 and shows that wholesale prices index for agricultural and industrial products respectively for Bangladesh rose from 100 in 1969/70 to 161 and 272 in December 1972. The index later rose, phenomenally, to 424 and 525 [11]. Note that the mention of such high rate of inflation at such an early stage of my paper is of some relevance to some of the following positions.

and therefore shaping attention on whether selective contraction of capacity should be adopted and, if yes, how. Although a previous study has shown that negative market returns from a given garden do not necessarily rule out high social profitability [5], there is no presumption that such is always the case.

This paper is a study of the level and structure of production costs in the tea industry essentially covering the period 1967-75. It is structured as under: Section II focuses on the movement of the level and the structure of production costs in the tea industry. Section III considers whether possibilities of cost reduction exist. Section IV discusses certain measures, specific and general, directed at rationalisation of cost and capacity. Section V presents the summary and conclusions.

II. MOVEMENT OF COST PER LB. IN BANGLADESH TEA INDUSTRY, 1967-75

Production Costs : Concepts, Data, Measurement

We define total cost as including all payments for skilled and unskilled labour, raw materials, and services, either human or from capital assets, directly used in manufacturing, transporting and selling the output, tea. Close access to internal accounts data of the enterprises in the sample permitted fairly accurate establishment of these cost components, save depreciation, for which the methodology followed is outlined below. Since we are interested in structural factors relating to prevailing costs, we shall not treat normal profits as a cost, since no cost of production can ever be negative but profits, in practice, can.

The data were collected at different times. The attempt began at mid-1973 covering, very systematically, 12 'A' class gardens (i.e., those annually producing on average more than 0.4 million lb. of tea). The sample has been considerably expanded and my estimates pertaining to 1974 are based on 23 'A' class gardens and 25 smaller gardens. However, the 1975 estimates are based on the above 23 'A' class gardens only.

Measurement of direct costs of production posed no problem. Depreciation however was somewhat problematic. Now, in principle, depreciation should measure annual wear and tear of capital assets together with the loss of present effective value owing to obsolescence. The wear and tear part of depreciation is a function of the assets' length of economic life, of the stage of economic life in which they are at a given time and the intensity of their use, while measurement of obsolescence necessitates knowledge of the rate of embodied technical progress in the industry producing the type of machinery and equipment in use in the enterprises

in question. We have assumed, for convenience, that obsolescence effect for the sample gardens is zero. We are thus left with the necessity of measuring annual wear and tear. Ideally, what one needs is precise information on the date of acquisition of a given asset, its economic life, the intensity of its use in the year in question. Most of the sample gardens operating with fairly old machinery and building, however, such detailed data were not available. Recourse was thus imperative to less satisfactory data sources. For 12 of the enterprises for which we had access to both internal accounts and balance sheet data, we had two estimates of depreciation. In the former case depreciation shown in the balance sheets was invariably higher than that shown in internal accounts data. Now it is well-known that balance sheet's depreciation may actually reflect the impact of differential incentives and correspond, only very remotely, to actual consumption of capital. For the others, we had available only the balance sheet information and thus only one estimate of depreciation.

For the first 12 gardens we have used the estimates contained in the internal accounts data. For the others, it was arbitrarily assumed that the balance sheet figure for depreciation involved a 20% overestimate. A 20% overestimation is, in our view, quite a serious thing. This assumption has the virtue that the only error margin in our estimated cost levels will probably stem from this assumption, all other cost components having been almost exactly estimated, and that the bias will be downward rather than upward, it being further reminded that we are interested in minimal cost estimates.

Cost Level in Bangladesh Tea Industry: 1967-75

Table I summarises the comparative cost levels in four different points in time: 1967, 1970, 1974, 1975.

TABLE I

COST PER LB. OF TEA, BANGLADESH, 1967-75

(Figures in Taka)

	Years				
	1967 ('A' class only)	1970 ('A' class only)	1974 'A' class	1974 Others	1975 ('A' class only)
Unit Cost	2.22	2.42	3.36	3.91	3.92

Sources: 1967 and 1970 figures from [4, p. 31].
1974 and 1975 figures from data collected by the author.

The table clearly shows that while average costs for 'A' class gardens were up only 9% in 1970 compared with 1967, the like increase in 1975 over 1970 is a high 62%. It is particularly important that, while the proportionate rise in 1974 over 1970 has been 39%, or a little over 9% a year on average, the like rise in 1975 over 1974 is at a relatively much higher level of 16.7%. There is no doubt that the pre-as-opposed to post-liberation period in Bangladesh has been characterised by fundamentally different cost conditions for the tea industry, and the evidence probably suggests an increasing rate of cost inflation towards the end of the period under review.

III. FACTORS RESPONSIBLE FOR COST INFLATION

The following does not, by any means, propose to be an exhaustive account of these pro-inflation factors. All that is intended is to present information on the structure of costs and the movement of that structure which, together with data on essential input prices, would permit rough conclusions about them.

Movement in the Cost Structure

Appendix Tables I and II show the percentage distribution of cost per lb. by functional heads. The following table below derived from those two tables neatly summarises the movement in cost structure.

TABLE II

COST STRUCTURE, SELECTED TEA GARDENS, 1970, 1975
(ALL FIGURES ARE RATIOS TO AVERAGE TOTAL COST PER LB. FOR THE SAMPLE)

Items	1970	1975
Cultivation and Planting	0.15	0.07
Processing	0.18	0.26
Tea Chests	0.07	0.10
Selling and Transportation	0.08	0.07
Administration	0.49	0.45
Others	0.07	0.05

Note : Figures may not necessarily add to 1.0 because of rounding error.
Source : See text.

Some comments on the source of data on which this and the following section are based are apposite. A source on which past exercises on costs and efficiency have often been based has been the Census of Manufacturing Industries (CMI) [1], but the CMI was not available for the period we were interested in. Instead, our results hereinafter are based on a rather small sample of 12 'A' class gardens in Sylhet. In part, this choice of ours has been a product of our desire to obtain convenient and close access to highly disaggregated data. It may be asked whether these 12 gardens adequately represent the industry. Let us note here that 80% of Bangladesh tea is grown on 'A' class gardens. Therefore, roughly speaking, what is representative of the 'A' class gardens in general is also representative of the industry. The next question is whether these 12 gardens adequately represent all the 'A' class estates. Notably, the sample estates produce about 29% of the output of all 'A' class estates put together. Moreover, almost all of these 'A' class estates face roughly the same labour laws and relative factor prices, about the same climate, and are in a homogeneous region. True, the public sector 'A' class gardens had been paying higher wages than private ones since 1972, but with the uniformity in the wage structure effective since the middle of 1975, even this heterogeneity ceases to be relevant. Thus there seems no reason why inferences drawn about policies for reduction of cost from 12 'A' class gardens will not under the circumstances, be more or less representative of other 'A' class estates and, by implication, of the whole industry.

Turning to Table II, one finds that the most noticeable change has occurred in the relative share of processing cost. Moreover, there has been a considerable fall in that of cultivation and planting costs. The next most important rise is due to increased tea chest costs. A 4% fall in the share of administrative expenses is the next most important relative change in the cost structure between the two periods.

Before going any further, it is important for our later purposes to present a picture of the movement in the prices of the essential inputs for the tea industry. Table III is relevant in this regard. The table shows that inflation of input prices has been considerable, if only lower than has affected the economy as a whole, as shown by the wholesale price index.

Turning to analyse what these changes in the cost structure mean in practice, it must be stated at once that all that we have are the cost structures at two points in time and, although certain broad directions of the movement of that structure emerge, there is no reason to believe that these directions really establish a trend. That is to say, two still pictures at two points in time do not constitute a trend by

any means. Especially so, since 1970 was a bumper, and 1975 a lean year in terms of crop. This is a caveat that must be borne in mind when we specifically analyse the changes in cost pattern.

TABLE III

INDEX OF PRICES OF IMPORTANT INPUTS FOR TEA INDUSTRY

(1970=100)

Items	Early 1974 (1)	Late 1975 (2)
a) **Wages**		
Male	100	164
Famale	100	167
Adolescent	100	170
b) **Fertilisers**		
Sulphate of Ammonia	100	209
Triple Superphosphate	184	313
Muriate of Potash	171	242
c) **Fuel**		
Firewood	127	182
Coal	105	475
Light Diesel Oil	436	586
High Speed Diesel	256	358
Furnace Oil	382	470
Petrol	371	467
Kerosine	375	550
d) **Chests**		
Full	134	179
Half	161	219

Sources : Col. (1) adapted from [4, p. 36].
Col. (2) computed by the author.

The rather sharp fall in the share of cultivation charges deserves some attention. From a comparison of Appendix Tables I and II one sees that, as compared with 1970, there has been a total cessation of extension planting, and a virtual absence of upkeep of young tea. The first is a legitimate policy because, considering the state of relative surplus in supply characterising the world tea economy [6, pp. 19-20], it would be particularly inappropriate to expand capacity. The second policy only reflects that the sample gardens are practically devoid of young

tea. However, of much greater concern is the fact that, from 5.5% in 1970, the relative share of fertiliser in total unit cost on an average for the sample fell to only 3% in 1975. In an agro-based industry, where yield substantially depends on fertilisers, such a fertiliser policy is apparently perverse. This fertiliser policy, however, is essentially due to relative shortage of fertiliser in 1975. There is evidence that the supply of chemical fertilisers to the tea industry throughout 1975 was lower than both 1974 level and the level desired by the industry, a situation due essentially to substantially lower fertiliser output in 1975 as opposed to 1974 [11, p. 15]. In fact, the relatively dismal output performance of the tea industry in 1975 vis-a-vis 1974 is partly explained by the fertiliser situation.

That there should be a drastic change in the relative share of processing cost is obvious enough, considering the rise in fuel tea chest prices and in plucking wages. The other changes are more or less self-explanatory.

An Exercise into Productive Efficiency in the Tea Industry

So far we have often referred to the escalating production costs in the tea industry without, however, making a necessary distinction between purely inflationary (whether demand-or supply-induced) as opposed to real factors which may be simultaneously operating on the industry. This distinction is absolutely essential, since the two groups of factors correspond to two rather different contexts, one general and the other specific, for both analysis and policy. For example, costs in an industry might inflate over time because of upward movement of factor prices, productive efficiency remaining the same.[2] If so, the analytic and policy context becomes quite general and the prognosis is that price stability in general is a necessary and sufficient condition for cost stability in the industry at hand. The situation is different when the cost inflation is a combination of changing prices and changing productive efficiency.[3] The prognosis here is that general price stability is necessary but not sufficient condition for cost stability, and that possibilities of endogenous cost reduction exist. Note, however, that efficiency is not entirely endogenously determined at the firm level. This is because production essentially implies organisation of many cooperant factors and, even given

[2]Productive efficiency over time refers to whether or not 'net' saving or dissaving has been achieved in factor inputs, and is on certain assumptions [16] interchangeable with total factor productivity [14]. However it must be noted that while exercises bearing on productive efficiency are of some policy interest when the various caveats, conceptual and com utational, relating thereto are borne in mind, the concept of efficiency, technical and economic, that underlies the whole discussion of productive efficiency is substantially at odds with the economic realities—market imperfections and inequalities in incomes and assets, to name the main two---prevailing in developing countries [15, pp. 11-16].

[3]Productive efficiency will hereinafter, be denoted by only efficiency.

the maximum feasible efficiency in the utilisation of each and every input for a given level of demand, efficiency may still be less than maximum feasible due to abnormal supply conditions. To give an easy example, one important aspect of efficiency is the rate of utilisation of capacity. Now, it is easily realised that underutilisation of capacity can owe itself to a host of factors, not least to the availability of raw material.[4]

Nonetheless, the above analytical distinction is valid, our purposes being to investigate, in general terms, the behaviour of efficiency in the tea industry. Our method, essentially, is to proceed from the assumption that there has been no change in efficiency, or, what is the same thing, in unit cost for each input, between 1970 and 1975. Fairly close access to micro-data permitted a classification of all costs by individual inputs or, where necessary, input groups. Then we had all necessary information on factor price inflation. Assuming the same efficiency in the two periods, it is possible to calculate what it would cost to produce a unit of tea in 1975. By comparing the percentage changes in these notional cost levels over actuals of 1970 with actual cost levels in 1975 it is possible to test our hypothesis about constant efficiency.

Appendix Table III shows 1970 total production costs in the 12 gardens of our sample classified as far as possible, by inputs/input groups, efforts being made to attain maximum homogeneity in aggregation. Probably the only exception happens to be the last row in that table. "All others", which is a mixed bag consisting transfer payment (taxes, membership charges of the *Bangladeshiyo Cha Shangshad*, etc.) and other miscellaneous expenses that were too difficult to allocate to other broad input groups. Nonetheless, we think, the table is sufficiently disaggregated for our purposes to form the basis for the proposed exercise.

The following table presents the percentage price increases in 1975 vis-a-vis 1970 as applying to different inputs/input groups.

The percentage increase in price of a given input group is of course an weighted increase, the weights being the 1970 relative share of a given input in total cost incurred on that group. Moreover, the table is based on the following observations:

a) As regards labour, the item 1(a) is self-explanatory. 1(b) reflects the fact that the clerical, technical and supervisory labour have not had any protection against the severe post-liberation inflation. Item 1(c) involves our hypothesis that the price for highly skilled labour in 1975 vis-a-vis 1970 is down by 5%. This hypothesis is based (a) on a change in the structure of skills. It should be

[4]Winston shows that capacity utilisation was strongly related to raw material availability in Pakistan [18, p. 48].

noted that the item 1(c) refers to total remunerations accruing to covenanted managerial, engineering and administrative personnel at garden and or head office level, both at home and abroad, and those to non-covenanted personnel of various, nontheless high, level of skills. Now the structure of these remunerations was dominated by covenanted staff and overseas advisers of the estates, about 55% to 60% accruing to these men in one form or another.

TABLE IV

PROPORTIONATE INCREASE IN 1975 IN PRICES OF INPUTS/INPUT GROUPS IN TEA INDUSTRY

(1970=100)

Items	Percentage Increase
1. Labour	
a) Unskilled	165.5
b) Clerical, Technical	100.0
c) Highly Skilled	50.0
2. Materials	
a) P. O. L.[a] Coal, Firewood	349.0
b) Fertilisers	221.0
c) Tea Chests	190.0
d) Spares	321.0
e) Office Stationery	229.0
f) Building Materials	195.0
g) Depreciation	226.0
3. Selling Cost	
4. All Others	150.0

Note : a) denotes Petrol, Oil, Lubricants.
Source : Table III and garden abstracts.

The situation has changed considerably since the liberation. For instance, there has been very substantial emigration of covenanted staff[5] from Bangladesh tea industry. Moreover, the Government of Bangladesh has imposed a fairly serious embargo on the remittance of advisory and secretarial expenses overseas ever-since the liberation because a body of experts had, in a review of the problems facing the tea industry during post-liberation period, had deemed them to be too high [12]. The departure of a fairly large number of very highly paid managerial and administrative men and the resultant vacuum being filled with younger and indigenous men with relatively much lower remuneration has meant an effective fall in the price, so to speak, for a unit of high-skill managerial and

[5]In 1975, covenanted personnel on our sample stood at only 21 as distinct from 60 in 1970.

administrative labour time. The fact that managers now no longer receive the once substantial ad-valorem commission gross sales goes to strengthen the above.[6] And, lastly, the salary cuts at the top will also weigh the under lying pay structure downward. In view of all these facts, the hypothesis that the salary structure for high-level manpower in the industry in 1975 has been lowered by 50% may be quite correct.[7]

Materials : In this group, all the items are based on data in Table V and the relative weights in 1970. Depreciation, however, needs some explanation. Typically, a large part of tangible capital often exists in the form of construction. It is important to know what proportion of assets in our sample estate is in construction, and what in machinery equipments, since the former is non-traded and the latter tradeable. The average share of construction in total fixed assets for the sample worked out at 52.50%, the remainder being in capital equipments. Given this structure of fixed assets, depreciation cost will rise, given the depreciation charge practice, due to two devaluations and the inflation in building material prices. The inflationary multiple for item 2(g) is thus based on the structure of fixed assets and the differential rates of price growth for the two categories of assets.

Selling costs have risen comparatively little. One reason for this is that prices for services are almost typically relatively stickier than commodity prices because, among other things, the demand for them is a derived one. All other expenses have also registered a comparatively smaller increase because (a) tax-structure during the period in the country has remained essentially inelastic [6, p. 19],(b) other transfer payments, being specific in nature, have remained unchanged.

Efficiency in the Tea Industry

Appendix Tables III and V in the text are the basis for the derivation of the Appendix Table IV. The changes in efficiency are shown below.

One sees that, as compared with 1970, the picture with regard to efficiency for the sample is mixed, with both improvements and reductions. And yet the table shows that possibilities of cost reduction through the efficiency route are open. On the whole, for those gardens in which efficiency in 1975 has improved, increasing productivity offset an average of 17.2% of the purely inflationary cost increases which would otherwise have resulted.

[6]Note that this commission has been treated as a cost in 1970, when it was operational.

[7]Note, further, that in 1975 the relative share of administrative expenses, 35 to 40% of which as a ru'e accrues to highskill labour, is down by 4 in relation to 1970.

TABLE V

CHANGES IN PRODUCTIVE EFFICIENCY IN SELECTED GARDENS, 1975

Garden	Notional Proportionate Increase in 1975 over 1970 Assuming 1970 Efficiency (1)	Actual Proportionate Increase in 1975 over 1970 (2)	Difference, due to Changes in Efficiency (1)-(2) (3)
a	172.5	151.7	20.8
b	171.7	175.1	−3.4
c	177.0	161.5	15.5
d	177.3	174.2	3.1
e	175.2	130.1	45.1
f	172.7	158.0	14.7
g	177.1	168.1	9.0
h	178.6	173.0	5.6
i	177.9	189.9	−12.0
j	178.1	154.7	23.4
k	174.0	179.5	−5.5
l	180.1	188.3	−8.2

Source : See text.

This is a result of some importance. One sees that a group of gardens in Bangladesh has succeeded in offsetting, in part, an inflationary cost-spiral. One likes to know if other gardens are in a position to follow suit. In this regard, it is important to indentify the pro-efficiency policies that the sample gardens followed. Once this is done, it would more clearly emerge whether or not these policies are of general as distinct from selective application. Only then can meaningful generalisations be made. Note further that the adoption of cost-economies of all possible types is an important condition for competitive viability of the industry like India, Ceylon, East Africa, Indonesia are not readily available. But yet there is some evidence that our costs are relatively too high in relation to Sri Lanka, at any rate. In an earlier draft, we have shown, on the basis of a published account of the Sri Lankan tea industry [3] that industry probably enjoys considerable relative cost ability vis-a-vis Bangladesh.

IV. COST REDUCING POLICIES

Economy in Labour Costs

Tea is a labour intensive product. Moreover, the tea industry in Bangladesh is still predominantly a private-enterprise industry. In any attempt to make the

industry more competitive, policies that economise on labour naturally will have the first priority. My sample gardens have been no exception. One sees, from the following table, that the ratio of labour to land has fallen quite considerably in certain cases.

TABLE VI

LABOUR TO LAND RATIO IN THE SAMPLE, 1970, 1975

Garden	1970 Labour/Land	1975 Labour/Land
a	0.78	0.73
b	0.87	0.83
c	1.11	1.05
d	0.95	0.91
e	0.92	0.93
f	1.08	0.97
g	0.86	0.80
h	0.94	0.88
i	0.98	0.88
j	1.02	0.97
k	0.95	0.89
l	0.91	0.81

Source : Garden abstracts.

The table shows that there has been considerable retrenchment of workers the labour/land ratio being down by 7% in 1975 in relation to 1970. Even though on a family estate it is difficult to reduce labour time employed, the sample gardens have attained what appears to have attained significant success in the narrow context of private costs.[8] One might, apparently plausibly, argue that the other estates, too, should likewise economise on labour, if they could. However it is quite as much plausible to argue that at a certain unspecified nutritional level, trying to raise surplus (or decrease losses) of the estate at the expense of labour's consumption may defeat itself, since beyond that level under consumption may cause underproduction [17]. Thus whether or not laying off labour in a given estate will on balance reduce unit costs is seen to depend on the average nutritional level of the estate at hand and the extent of that lay-off. Even so, there is

[8]In a broader social and humanitarian context, this policy must be judged not so successful, as it must have led to a further impoverishment of an already poor malnutritioned stock of tea workers [13]. Already, policies of retrenchment have driven some unemployed workers to relative desperation. There are authentic reports of unemployed adult males offering themselves for full time jobs at adolescent wages.

no doubt that the existing labour to land ratio in Bangladesh is comparatively very high [4], a *fortiori*, when it is remembered that a high proportion of the acreage in the industry is in fact vacant. Thus there is a case that a moderate labour retrenchment on estates with labour to land ratios higher than 1.0 may offer between moderate to sizeable economies. The nutritional problem referred to above will, however, still remain to be fully dealt with. In the ultimate analysis, it is very difficult to give a judgement on the relative elasticities of unit cost with respect to a reduction in the labour time employed vis-a-vis an increase in wages. In ignorance, we assume that a labour lay-off is a more effective means of attaining short-run economies than increase in wages. In practice, too, the former will be relatively more feasible for some time since the industry has only recently had a substantial proportionate wage increase.

Economy in Capital Costs

The gardens in our sample have attained a fair amount of economies with respect to capital as well. This was done by substantially raising capacity utilisation of the factory of a given estate of the sample into which tea leaves, not only from the estate at hand but also from adjacent estate in the sample, were fed. Second and third, factories were opened only when, due to the advancement of the growing cycle, the output of leaves exceeded the capacity of the first factory. This kind of selective collectivisation in manufacturing has permitted economies in terms not only of fuller capacity utilisation but of fuel.[9] This is an illustration of an efficient entrepreneurial response, in a cost sense, to unfavourable relative fuel prices. Is the rest of the industry capable of the above organisational improvement? Given the present pattern of ownership, the other Agency House Gardens and those in the public sector can adopt this improvement, if permitted by locational factor. The same is true, more or less, of the gardens in the public sector. However, the proprietary gardens, of which there are 76, but which account for only 20% of the industry output, can not possibly adopt the refinement given contemporary organisation in the industry.

Economies on Managerial Input

We have said above that the sample gardens have experienced a very sizeable departure of some very experienced managers and administrators. In 1970, there were 8 English planters on these selected estates with 25 to 30 years of

[9]Since drying is an essential part of manufacturing tea, the dryer has to attain a critical minimum temperature before it begins to process teas. The warm-up time, and the associated fuel consumption, has been reduced considerably by running some factories practically twenty four hours.

managerial experience behind; in 1975, there was none. Also, the modal managerial experience is surely much less in 1975 vis-a-vis 1970. And yet these estates are producing efficiently, both cost, and output-wise, 1974 crop incidentally, being a all-time record. The tentative implication is that it is possible to achieve substantial cost-economies by dispensing with expatriate managerial labour, with very high relative remunerations, and developing an alternative skill-base comprising of indigenous personnel. This also goes to show, in part, that the expatriate as opposed to indigenous managerial labour on our sample are, more or less, homogeneous inputs, although relative remunerations for the two categories would, apparently, render them essentially different inputs. This is a point of some practical interest since this dualism, more apparent than real, in skilled labour market, may not be confined only to the tea industry but involve other areas where foreign investment in Bangladesh is already important and/or growing. Pharmaceutical and oil companies are perhaps important in this regard.

Again, economy in managerial input is something which all gardens, in principle, should be able to achieve, in varying degrees. Thus what emerges is that the selected gardens have realised some economies in the use of three important inputs, labour, capital and managerial skill and that these can be achieved, even in the existing framework, by other sterling and the public sector gardens, which, as we have said above, produce 80% or more of the tea output and broadly represents the industry as a whole.

Land Productivity

The following well-known measures for increasing yield per acre should be adopted :

a) In-filling of vacancies,[10] such vacancies often being very high, the ratio for such vacant areas to area under tea for our sample, as of 1973, being 15.2%.

b) Block replanting of old and uneconomic sections. It is important to emphasise that the vacancies and uneconomic sections be planted with the best possible stands of tea available in the industry. If competitiveness and diversification have to be attained simultaneously, yield per acre must rise rather drastically from the per cent 650 lb. an acre.

c) Adoption of adequate measures for pests, disease and weed control, fertilisation and irrigation measures.

d) Enforcement of intensive cultivation to ensure correct intercultural operations.

[10]Young tea-plants often die; the spots, in the absence of fresh planting called in-filling, remain vacant.

In fact, raising land productivity is an important precondition for achieving cost economies. The *modus operandi* for increasing yield has been treated extensively elsewhere [12;13]. But it is important to stress that what Bangladesh needs is a policy for enhancement of land productivity, not in all, but in rationally selected estates. That some estates are already highly uneconomic is very well recognised in the official circles and capacity in these should be gradually written off. These estates can, subject to suitable organisational, financial and technical adjustments, form the basis for productive diversification into other crops or which there is considerable physical and/or agronomic scope [13, p. 98]. Furthermore, with yield growing, some of the capacity even in the presently economic estates will be rendered redundant. Thus diversification is seen to be a general process involving the whole industry in general.

V. CONCLUSIONS

The main conclusion of this paper is that Bangladesh tea industry has been subject to such degrees of annual cost inflation since 1971 as, in all probability, have put it at a serious relative cost disability vis-a-vis other major competitors, notably Sri Lanka. The principal determinant of the extent of such inflation has been the especially severe post-liberation inflation. However, the study also shows the character and consequences of realistic entrepreneurial response to unfavourable relative input prices, working via enhanching efficiency to minimise cost. In particular, the successful development of an indigenous skill basis consisting of local and cheaper managerial factors to effectively replace a body of very highly paid but probably essential homogeneous expatriate skills is of a relevance that goes beyond the tea industry. It is argued that the specific economies adopted by the sample gardens are of quite general application. This element of general applicability is particularly true of measures that economies land. However, the industry must nationalise not only costs but also capacity in the broadly context of a possibly productive diversification out of tea production.

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Appendix

TABLE I

COST STRUCTURE OF SELECTED TEA GARDENS, 1970

(FIGURES ARE RATIOS TO TOTAL COST PER LB.)

Items	Gardens											
	a	b	c	d	e	f	g	h	i	j	k	l
Production Cost												
a) **Cultivation and Planting Cost**												
Cultivation	.04	.02	.03	.02	.02	0.3	.04	.04	.03	.04	.06	.04
Manuring	.05	.05	.05	.06	.06	.06	.06	.05	.06	.06	.06	.04
Extension of Planting		.02		.01	.01	.01	.01	.01	.02	.01	.01	.01
Nurseries and Seeds	.01	.02	.02	.02	.02	.02	.02	.01	.03	.02	.02	.02
Upkeep of Young Tea	.02	.04	.02	.01	.02	.02	.02	.03	.02	.01	.02	.03
Sub-total (a)	.12	.15	.12	.12	.13	.14	.16	.14	.16	.14	.17	.14
b) **Processing Cost**												
Manufacturing Cost	.06	.06	.07	.06	.06	.06	.06	.08	.05	.06	.06	.06
Fuel and Power	.04	.04	.05	.05	.04	.04	.06	.06	.06	.05	.05	.03
Machinery Repair	.04	.02	.04	.03	.02	.01	.02	.02	.03	.02	.03	.02
Local Freight and Stores	.04	.04	.04	.04	.05	.04	.05	.04	.04	.03	.03	.04
Sub-total (b)	.18	.16	.19	.18	.17	.16	.19	.16	.17	.17	.17	.15
c) **Tea Chests**	.07	.07	.08	.08	.08	.07	.06	.08	.05	.08	.07	.06
d) **Selling and Transportation Cost**												
Railway Freight	.03	.02	.02	.02	.02	.02	.02	.02	.02	.02	.02	.02
Warehousing	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
Brokerage	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
Tea Cess	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
Agency Commission	.03	.02	.03	.04	.04	.03	.02	.02	.03	.03	.03	.03
Sub-total	.09	.07	.08	.09	.09	.07	.06	.07	.07	.08	.07	.07

(Contd.)

TABLE I (*Contd.*)

Items	Gardens											
	a	b	c	d	e	f	g	h	i	j	k	l
e) **Administrative Cost**												
Salaries and Directors' Remuneration	.14	.12	.12	.12	.14	.12	.16	.13	.12	.11	.13	.13
Welfare and Medical Expenses	.26	.30	.30	.29	.29	.32	.37	.27	.31	.29	.29	.27
Rent Rates and Taxes		.02	.01	.01			.02	.01			.01	.01
Repairs and Maintenance	.01	.04	.03	.02	.01	.02	.04	.02	.02	.02	.02	.01
Insurance		.01		.01	.01		.01		.01		.01	
Miscellaneous	.04	.02	.03	.03	.02	.02	.04	.03	.03	.03	.03	.03
Sub-total (e)	.45	.51	.49	.48	.48	.50	.63	.47	.50	.46	.49	.45
Total (a) to (e)	.92	.96	.95	.94	.94	.94	1.20	.96	.94	.93	.96	.88
f) **Financial Cost**												
g) **Depreciation**	.08	.04	.05	.06	.06	.06	.05	.04	.06	.07	.04	.12
Total	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

Note : The figures may not add to the sub-totals and the latter to 1.0, because of rounding errors. This note applies to Table II as well.

Source : [4].

TABLE II

COST STRUCTURE OF SELECTED TEA GARDENS, 1975

(FIGURES ARE RATIOS TO TOTAL COST PER LB.)

Items	Gardens											
	a	b	c	d	e	f	g	h	i	j	k	l
Production Cost												
a) **Cultivation and Planting Cost**												
Cultivation	.03	.02	.03	.03	.02	.04	.03	.05	.03	.03	.02	.04
Manuring	.04	.04	.04	.01	.01	.03	.01	.03	.05	.02	.05	.03
Extension of Planting												
Nurseries and Seeds		.01	.01						.01			.01
Upkeep of Young Tea						.01			.01			.01
Sub-total (a)	.07	.07	.08	.04	.05	.09	.04	.08	.10	.05	.07	.08
b) **Processing Cost**												
Manufacturing Cost	.06	.06	.06	.06	.07	.06	.06	.07	.06	.07	.06	.06
Fuel and Power	.12	.08	.11	.12	.07	.10	.19	.10	.08	.12	.09	.13
Machinery Repair	.05	.04	.03	.05	.02	.04	.03	.03	.03	.04	.05	.02
Local Freight and Stores	.05	.06	.05	.07	.05	.06	.05	.06	.04	.04	.07	.04
Sub-total	.28	.24	.25	.30	.21	.25	.33	.26	.21	.27	.27	.24
c) **Tea Chests**	.09	.09	.07	.09	.13	.09	.14	.07	.05	.10	.11	.11
d) **Selling and Transportation Cost**												
Railway Freight	.03	.02	.02	.02	.02	.02	.03	.02	.02	.30	.02	.02
Warehousing	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
Brokerage	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	01
Tea Cess	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
Agency Commission	.02	.01	.02	.03	.04	.02	.01	.01	.03	.02	.01	.02
Sub-total	.08	.06	.07	.07	.09	.06	.07	.06	.08	.08	.06	.07

(*Contd.*)

TABLE II (*Contd.*)

Items	Gardens											
	a	b	c	d	e	f	g	h	i	j	k	l
e) **Administrative Cost**												
Salaries and Directors' Remuneration	.11	.09	.09	.08	.08	.09	.06	.09	.09	.07	.08	.08
Welfare and Medical Expenses	.26	.29	.35	.31	.34	.31	.31	.31	.36	.29	.30	.31
Rent Rates and Taxes	.01	.02	.01	.01	.01	.01	.02	.01	.01	.01	.01	.01
Repairs and Maintenance	.01	.02	.01	.01	.01	.03	.01	.01	.01	.01	.01	01
Insurance	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01		
Miscellaneous	.03	.03	.02	.03	.02	.03	.01	.04	.03	.02	.02	.04
Sub-total (e)	.43	.45	.49	.45	.46	.47	.42	.47	.51	.41	.42	.45
Total (a) to (e)	.95	.92	.99	.95	.94	.96	1.00	.94	.95	.91	.93	.95
f) **Financial Cost**	.01	.04		.01		.01			.02	.03	.03	
g) **Depreciation**	.04	.03	.04	.04	.05	.04		.06	.04	.06	.04	.05
Total	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

Note : Denotes insignificant, defined as less than 0.5% of total unit cost. Depreciation for garden 'g' is nil because this particular garden did not at all operate its factory throughout 1975, its leaves being manufactured at either '1' or 'f'. Thus there was no depreciation of equipments at factory. However, that of tractors, trucks, and building can be taken as quite insignificant in relative terms.

Source : Computed by the author on the basis of garden abstracts.

TABLE III

PERCENTAGE DISTRIBUTION OF UNIT COST OF TEA BY INPUTS/INPUT-GROUPS, 1970

Items	Gardens											
	a	b	c	d	e	f	g	h	i	j	k	l
1. Labour												
a) Unskilled	27.4	36.3	37.2	35.5	35.3	35.8	33.6	35.1	37.2	36.5	33.5	33.5
b) Clerical, Technical, etc.	6.8	8.0	7.4	5.3	5.1	4.7	5.6	6.6	6.3	4.9	6.4	6.7
c) Highly Skilled	7.8	8.4	8.8	9.5	11.1	7.4	6.1	8.7	10.2	8.6	7.7	7.4
2. Materials												
a) P.O.L., Coal, Firewood	4.0	4.0	5.0	5.0	4.0	4.0	6.0	6.0	6.0	5.0	5.0	3.0
b) Fertilisers	5.0	5.0	5.0	6.0	6.0	6.0	6.0	5.0	6.0	6.0	6.0	4.0
c) Tea Chests	7.0	7.0	8.0	8.0	8.0	7.0	6.0	8.0	5.0	8.0	7.0	6.0
d) Spares	2.8	3.6	4.1	3.7	4.2	3.3	2.4	4.1	3.7	3.1	2.8	4.0
e) Office Stationery	1.7	3.0	3.8	3.1	3.4	2.8	2.6	3.6	4.1	3.3	3.1	3.8
f) Building Materials	0.9	1.8	2.0	1.6	2.7	1.6	1.4	4.0	2.7	1.5	0.8	4.2
g) Depreciation	8.0	4.0	5.0	6.0	6.0	6.0	5.0	4.0	6.0	7.0	4.0	12.0
3. Selling Cost	9.0	7.0	8.0	9.0	9.0	7.0	6.0	7.0	7.0	8.0	7.0	7.0
4. All Others	19.6	11.9	5.7	7.2	4.9	12.2	19.2	7.8	5.7	8.1	16.7	9.4

Source : Garden Abstracts.

TABLE IV

PROPORTIONATE INCREASE IN COSTS BY INPUT/INPUT-GROUPS GIVEN 1970 PRODUCTIVE EFFICIENCY

(1970=100)

Items	Gardens											
	a	b	c	d	e	f	g	h	i	j	k	l
1. Labour												
a) Unskilled	165.3	165.6	165.6	165.4	165.4	165.4	165.5	165.5	165.6	165.5	165.4	165.4
b) Clerical, Technical,etc.	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
c) Highly Skilled	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.00	50.0	50.0	50.0	50.0
2. Materials												
a) P.O.L., Coal, Firewood	347.5	347.5	348.0	348.0	347.5	347.5	348.3	348.3	348.3	348.0	348.0	35.0
b) Fertilisers	220.0	220.0	220.0	221.7	221.7	221.7	221.7	220.0	221.7	221.7	221.7	220.0
c) Tea Chests	190.0	190.0	190.0	190.0	190.0	190.0	190.0	190.0	190.0	190.0	190.0	190.0
d) Spares	317.9	319.4	319.5	318.9	319.0	321.2	320.8	319.5	318.9	319.4	317.9	320.0
e) Office Stationery	229.4	226.7	228.9	229.0	229.4	228.6	226.9	227.8	229.3	227.3	229.0	228.9
f) Building Materials	200.0	194.4	195.0	193.8	196.3	193.8	192.9	195.0	196.3	193.3	200.0	195.2
g) Depreciation	226.3	225.0	226.0	226.7	226.7	226.7	226.0	225.0	226.7	225.7	225.0	226.7
3. Selling Cost	180.0	180.0	180.0	180.0	180.0	180.0	180.0	180.0	180.0	180.0	180.0	180.0
4. All Others	150.0	149.6	150.9	150.0	151.0	150.0	150.0	150.0	149.1	149.3	150.3	150.0
5. Average Total Cost	172.5	171.7	177.0	177.3	175.2	172.7	177.1	178.6	177.9	178.1	174.0	180.1

Sources : Appendix Table III and Table IV in the text.

Agrarian Structure and the IRDP Preliminary Considerations*

by

ABU ABDULLAH
MOSHARAFF HOSSAIN,
AND RICHARD NATIONS

I. INTRODUCTION

The present essay is very far from being an "evaluation" of the cooperative experience in Bangladesh. Nor does it have any pretensions of representing a piece of original research. It does, however, attempt to lay down certain guidelines and raise certain issues which are, in the opinion of the authors, fundamental to any attempt at a meaningful evaluation of any rural development programme. We have in particular taken some pains to point out what seemed to us to be some critical ambiguities, even evasions, in much current thinking about the Integrated Rural Development Programme. To be more specific, we have tried to dispose of the comforting myth that the "cooperative way" represents somehow a "third way of development" that is neither capitalistic nor socialistic, and the associated piece of wistful thinking that holds that growth and equity can be simultaneously promoted through essentially reformist programmes like the IRDP. If the reader decides at this point that we are anti-IRDP, he or she should reserve judgment until we reach our conclusions.

The plan of the work is : Sections II to IV provide an outline of the agrarian structurer; Section V examines the performance of agriculture during the Pakistan era; Section VI is devoted to the Comilla experiment; Sections VII and VIII examine the Thana Irrigation Programme and try to provide some evidence on the distributional impact of the currently favoured irrigation technology. Section IX provides a general background to the IRDP, while Section X draws together the strands of the argument an attempts a summary analysis of the political economy of the IRDP.

*This is an abridged and revised version of a study done by the authors in 1974 under the sponsorship of the Swedish International Development Agency [2]. The authors were at that time Research Economist, BIDS, Professor of Economics, Dacca University, and Visiting Scholar, BIDS, respectively. For any changes in orientation that may have occurred during revision,the first author bears full responsibility, since it was not possible to contact the others.

The publication of this article in this form owes a good deal to the persistent prodding of Dr. Mohiuddin Alamgir. It is for the readers to judge whether this is something for which he deserves thanks.

II. THE ORGANIZATION OF AGRICULTURE

Bangladesh is a land of family farms. Not family farms in the American sense of being run as family business enterprizes, but in the sense that most farming activity is carried out on family land, with family labour, and for family consumption. Tenant farming, mainly on a cropsharing basis, is present, but total tenant-operated area was never a very high percentage of the total. In 1960, the last year for which we have reliable data, 61 per cent of all farms were owner farms, 37 per cent were owner-cum-tenant farms, and the remaining 2 per cent were tenant farms. The average farm size was 3.5 acres, tenant farms being smallest (2.4 acres), and owner-cum-tenant farms largest (4.3) acres [22, Table 2, p. 52].

Two things in particular should be noted :

(i) the small average size of holdings, and

(ii) the relatively small area operated as large holdings.

If we take 12.5 as our dividing line between "large" and "medium" holdings, then large farms constitute only about 3.5 per cent of all farms but operate 19 per cent of the total farm area. However, farms 25 acres and over are only about 0.5 per cent of all farms, and the amount of land they operate—roughly 5 per cent—is not really large enough for them either to dominate the countryside[1] or become significant as spear-heads of innovation even if they were inclined to do so—a point to which we shall return later. As a matter of fact the larger landowners in Bangladesh have never really shown a great deal of interest in being enterprizing, innovative, and in general bringing about on economic transformation of the countryside. To look for an explanation of this fact would involve a fascinating excursion into the realms of economic and social history, anthoropology and social psychology. The fact itself has been fairly well documented.[2] In fact, even in the IRDP cooperatives it is usually found that larger farmers cultivate relatively less HYV.

Sixteen years is a long time, and much must have changed since then. There have been a series of socalled "Master Surveys", but unfortunately the quality is very poor. The latest published one is for 1967/68. Here it appears that they have thoroughly confused the concepts of "area operated" and "area owned", and come up with a hybrid which means nothing. This makes it impossible to compare the area under different tenurial arrangements. However, such figures as can be salvaged has been presented in Table A-1. Perhaps the most notable

[1]They do, of course, own much more land. But even if they owned all the land leased in by others—about 18 per cent of all cultivated land—it would still hardly amount to a "feudal" regime.

[2]See, e.g., [23; 30].

change between these two dates is the increases in the incidence of pure tenancy. Tenant-operated area hardly changed at all—it was still approximately 18 per cent. Considered as a per cent of all farms, pure tenant farms continued to be rather insignificant. But the change is still dramatic enough to merit attention. Table I below shows this quite clearly.

TABLE I

PERCENTAGE CHANGE IN NUMBER OF DIFFERENT TYPES OF FARMS, 1960 TO 1967/68

	Owner	Owner-cum-tenant	Tenant	Total
Small	27.62	negligible	144.83	22.73
Medium	23.77	– 14.28	112.54	5.51
Large	– 4.66	– 27.47	520.40	– 17.91
Total	22.41	– 10.83	144.57	11.90

It would appear that some kind of polarization process was indeed at work during these years, working towards eliminating the hybrid category of owner-cum-tenant, mainly to the benefit of pure tenancy. It is also notable that the largest percentage increase has been in the "large" tenant group[3].

The area operated by pure tenants also went up—in fact went up even more, so that the overall size of tenant farms increased. The percentage increase in tenant farm area was 224.9 for small farms, 225.2 for medium farms, and 759.9 for large farms.

It is impossible to be sure without further research about the significance of this development. It certainly looks like the development of a minuscule but dynamic capitalist sector within agriculture, accompanied by the alienation of the small and marginal farmers from their land.

All this is also somewhat outdated by this time. On the current situation in the rural areas research is urgently needed.

Production is mainly for consumption, as has been mentioned. Produce is marketed to the extent that binding financial obligations exist (taxes or rent to be paid, debts that must be repaid in cash, and essential industrial products—textiles, kerosene, matches etc.—that one has to buy), or simply as a vent for abnormal surpluses. This applies, naturally, only to the small farmers.

[3]"Small"—Less than 2.5 acres, "medium" 2.5. and Less than 7.5 acres, and "large" 7.5 acres and over.

Data on marketed surplus are scanty and of doubtful methodological quality. Available evidence suggests that aroud 10 per cent of the rice crop (8 per cent for *aus*, 12 per cent for *aman*, and 14 per cent for *boro*), 87 per cent of the jute crop and 83 per cent of sugarcane is sold [20, Tables 5 and 16]. However, a survey conducted by the Directorate of Agricultural Marketing in 1973/74 found that about 30 per cent of the total rice crop was being marketed. This may reflect in part growing commercilization, and in part an expansion of the rural rice market through expropriation of the peasantry. Partly it may simply be a question of short-term response to price changes. One would naturally expect marketed surplus to fluctuate a good deal from year to year, with corresponding fluctuations in urban availability and prices. This may be offset to some extent by stock adjustments both by growers and traders, and by offtakes from government sources.

III. RURAL EMPLOYMENT AND THE LANDLESS

Wage employment in agriculture is present, but mostly as a supplement to domestic labour, not as a substitute for it. In 1960, out of a total of 6,139,480 holdings, only 834,020, about 14 per cent, reported permanent hired labourers. However, as many as 3,159,060 reported having employed casual labour [22, p.78]. There were 1.2 million permanent hired labourers, while according to the 1961 census, there were in the country at that time 2.47 million landless agricultural labourers. So just about held the landless labourers had secure employment.

According to the censuses of 1951 and 1961, the number of landless agricultural labourers increased by 63 per cent in ten years, while cultivators as a whole increased by 33 per cent. In 1951 landless labourers (12 year and over) were 14.25 per cent of all cultivators, while in 1961 the percentage had risen to 17.52.

Comparable figures are not available for later years. However, we collected figures on 7,710 rural households in 12 districts of Bangladesh from the IRDP Benchmark Survey, conducted in 1973/74. Detailed district wise figures are provided in the Appendix Table II. In this sample,[5] the percentage of landless to all households ("landless" being defined as those households having (i) no farm land and (ii) having homestead land not exceeding 33 decimals) was 37.60.

There really is no way one can deduce from this figure—even apart from questions of its reliability—anything concerning the rate of growth of landlessness. The

[4]Permanent hied labour means persons who work on the farm and receive regular monthly, quarterly, or yearly salary in cash or kind. Casual labourers are those hired off an on and paid on a daily basic.

[5]Admittedly neither sufficiently large nor very scientifically drawn—we carried out a complet' enumeration of all households in 96 villages or *paras* which were picked "intuitively at random'- i.e., by grabbing any bundle of schedules that looked neither too arge nor too small.

census figures quoted above are for "landless agricultural labourers" as a percentage of the "civilian labour force". If one assumes that participation rates as well as household sizes are the same for all categories of the total agricultural labour force (as defined in the 1961 census) then one could deduce that 17.52 is also the percentage of landless labourer households to total households. To obtain the percentage of all landless, one would have to add to the agricultural labourers the other groups that may be presumed to be landless—i.e., (1) "renting all land tilled", (2) "renting land tilled and also working for hire", and (3) "sharing crop".[6] This operation yields, for 1961, a figure for landlessness of 21.9 per cent.[7] However, this probably significantly understates the extent of landlessness for three reasons : (1) participation rates are likely to be higher for other groups as compared to the agricultural labourers, (2) household sizes are known to be smaller for the poorer sections of the rural population, and (3) we have left out other landless people who are included in the 1973/74 figure—artisans, petty traders, etc.

Both the 1951 and 1961 censuses also present data on "owners of agricultural land". If one were to take these figures seriously, then in 1961 only 19 per cent of the rural population owned agricultural land. One suspects that the main problem here is that a legalistic definition of landownership was applied ("An owner of Agricultural land is one who is shown as such in the Revenue records...) in an area which still has barely started the transition from status to contract. In particular minors who belong to landed families, and should therefore, for analytical purposes, be induded among landowners, would be fact rarely appear on revenue records. A comparison of the age pyramid of the total rural population with that for the "landowners" makes this clear.

TABLE II

PERCENTAGE OF RURAL POPULATION RETURNED AS LANDOWNERS, BY BROAD AGE GROUPS, 1961

(1) Age Group	(2) Rural Population	(3) Landowners	(3) as % of (2)
0-9	17,979,408	372,849	2.1
10-19	8,031,743	850,407	10.6
20-39	13,001,890	3,649,681	28.1
40-59	6,635,580	3,000,273	45.2
60 & Over	2,550,898	1,279,598	50.2
All Ages	48,193,509	9,152,806	19.0

Source : [21, Table 13, pp. III. 66-67, and statement 8-N, p. V.-18].

[6]One presumes that, since there is a separate "sharecropper" category, "renting" refers to renting for money, but this is nowhere made clear.

[7]Calculated from [21, Table 5, pp.v. 108-109].

Even the highest percentage—that for the age group 60 and over—is unacceptably low compared to everything we know about Bangladesh rural society.

From the IRDP data, a subsample of 14 villages was selected for more intensive analysis. (Actually many of these turned out to be *paras* rather than villages, so that the average size is quite small.) For this subsample, the percentage of landless households was found to be 38. Detailed breakdown of their means of livelihood is provided in the following table.[8]

TABLE III

MAIN AND SUBSIDIARY OCCUPATIONS OF THE LANDLESS

Occupation	Number and Per Cent Reporting as			
	Main		Subsidiary*	
	No.	Per Cent	No.	Per Cent
Agricultural Labour	113	16.1	240	37.2
Non-agricultural Labour	246	36.2	313	48.5
Business	84	12.4	36	5.6
Fishing	82	12.1	5	0.8
Service	52	7.7	nil	—
We2ving	23	3.4	nil	—
Begging	18	2.7	2	0.3
Other	62	9.1	50	7.7
Total	680		646	

*N.B. The numbers are people mentioning the given profession as a subsidiary one. Since the same person may mention more than one, the numbers overlap, so that the column total is meaningless (it could well have exceeded the number of landless).

It should be noted that these figures refer to profession of head of household only. Possibly if we had included information on other family members, labour (agricultural as well as non-agricultural) would have been more important. It is interesting that non-agricultural labour seems to be more important than agricultural labour. Another noteworthy fact is the insignificance of sharecropping. It has been induded among "others" in the table, since only three mentioned it as their main occupation, and 22 as a subsidiary one. This should not surprize us, since, as Lenin pointed out long ago, it is typically the *partially* expropriated who are exploited through sharecropping arrangements [31, pp. 205-208].

For figures on the use of hired labour, we have to go back to the 1960 census of agriculture.

[8]More detail will be provided in a forthcoming note.

TABLE IV

THE USE OF HIRED LABOUR IN AGRICULTURE, BY SIZE OF HOLDING

Holding Size (acres)	Percentage of Holding Reporting		Permanent Hired Labourers Per Reporting Holding
	Permanent Hired Labour	Cassual Hired Labour	
All Sizes	13.58	51.45	1.43
Under 0.5	0.80	11.24	1.44
0.5 to under 1.0	1.29	25.79	1.26
1.0 to under 2.5	3.61	42.75	1.14
2.5 to under 5.0	12.67	64.17	1.10
5.0 to under 7.5	27.92	78.85	1.18
7.5 to under 12.14	47.14	87.56	1.41
12.5 to under 25.0	68.08	92.81	1.94
25.0 to under 40.0	84.32	96.30	3.01
70.0 and Ovel	85.68	96.31	12.71

Source : [22, Table 49, p. 78].

One cannot draw any firm conditions on the importance of hired labour in the production process from the above data, particularly since data on the number of casual labourers are missing. The overall pattern is pretty much what one would expect, except for the anomalous fact that the number of hired labourers per holding actually dedines with increasing holding size until we reach the over—5 acre category—a curiosum for which we have no explanation to offer.

With limited land, expanding rural population, and limited opportunities for urban employment, one would expect rural landlessness to be growing in any case, even without the polarizing effect of market forces.

The income of this, the poorest section of the rural population, seems to have remained at a more or less constant level over the last two and a half decades. According to estimates made by Bose [14] and Alamgir [6], the annual real wages of agricultural labour (at 1966 prices) were Tk. 697 in 1949, never equalled this until 1961 (773), hit an all time high of Tk. 852 in 1964, another high—Tk. 834—in 1969, and declined steadily from then on to Tk. 580 in 1973. In the meantime, as the number of landless grow, more and more of them must be finding employment harder to get. The burgeoning of slums in and around Dacca attest to this fact. Clearly an explosive situation is being built up in the rural areas of Bangladesh. What is surprizing is that the explosion has not yet occurred. To understand why it has not, and to set the problem of agrarian change in its proper perspective, it is necessary to understand the structure of village society.

IV. VILLAGE SOCIETY CLASS KINSHIP AND FACTION

Practically no work has been done on trying to identify classes in rural Bangladesh, far less to make any estimate of their numerical strength. Sometimes the impression is conveyed that rural society in Bangladesh is classless, that it is economically too undifferentiated to have classes.

In most economic writings, one would find a classification of villagers into farmers, landless labourers, artisans, and petty traders. Farmers would be then classified according to tenure (owner farmer, owner-cum-tenant farmer, and tenant farmer are the usual categories used) and also graded according to area operated or owned. (Data on area owned are available only for a few village studies.) It is customary to classify farmers according to size of holding into "small", "medium", and "large" or "surplus" farmers. A slightly more elaborate scheme would distinguish between "marginal" and "small" farmers. The most commonly used dividing points are 1 acre, 2.5 acres, and 7.5 acres.

As Hamza Alavi [8] has pointed out, classifying households according to landowning status or income does not constitute class analysis. One must in principle identify three sectors: the feudal, the peasant, and the capitalist. (Possibly one should also have a parallel breakdown of rural industry and trade into "domestic" and capitalist".) Then within each of these modes of production one can identify the classes who are related through a nexus of exploitation.

We have already seen that the "feudal" sector in any meaningful sense of the word is exiguous in Bangladesh. Only 18 per cent of the cultivated land is tenant-operated, and not infrequently the "landlord" is no better off—perhaps even worse off—than the tenant. In fact in 1960, out of 3.95 million areas that were tenant-operated, 7.91 or just under half were rented in by owner-cum-tenant farmers operating 5 acres or more. On the other hand, available data do not permit us to identify any class living exclusively or mainly off rents.

We lack evidence as to whether there exists a capitalist sector in our agriculture. By "capitalist" sector we have in mind a set of farmers whose production is geared primarily to the requirements of the market, who treat farming as a business, and who depend on hired labour. (This definition is intended not to resolve the unconcluded controversy surrounding these issues,[9] but to evade it.) However, there is a fair amount of word-of-mouth evidence that particularly since the introduction of new seeds, the liberation of Bangladesh, and soaring rice prices, more and more peasants have becomes sensitive to the profit motive. However, in our view the main vehicle of capitalism in agriculture is the system of cooperatives that is being evolved—a position we shall elaborate later.

[9]See, e.g., [9; 11; 15; 39].

If Bangladesh agriculture is neither feudal nor capitalist, is it the kind of peasant economy depicted by Chayanov [16]? In our opinion that also would be a misleading characterization. Our view of rural Bangladesh does indeed include, as the core production relation, a petty peasant mode of production. But this mode is on the one hand being eaten away from within by usury capital, and on the other hand it is exploited by domestic and foreign capitalism through the mediation of merchant capital. To this ensemble the iabel "semi-feudal" may be applied, as long as one is not thereby misled into imputing logical or historical connections with feudalism—though one must admit that this description is very acutely presaged in Marx's description of the peasant mode of production as a transitional stage between feudalism and capitalism [36, Vol.I, p. 510].

Thus, on the one hand, we accept as appropriate for Bangladesh Shanin's characterization of the peasantry as "a social entity of comparatively low 'classness', which rises in crisis situations" [45, p. 213], and take his point about the barriers to polarization set up by the internal structure of peasant society [45, Ch. 3 *et Passim*] On the other hand, we submit that concentrating on this aspect could lead one to underestimate emergent class conflicts and change processes in rural society. On the whole, however, we would maintain that the agrarian problem in Bangladesh—the poverty, the stagnation, the backwardness—has to do precisely with the fact that the dominant mode of production is petty peasant production.

But this must not be taken to imply that there is no stratification, no relations of domination and submission, no inequality in the rural sector. The inequality, however, is made tolerable, the domination veiled, and the stratification obscured by kinship and quasi-kinship formations in which dominance is legitimized through extra-economic, personalized sanctions. A leading family which will almost certainly be a landed one, gathers around itself followers of a lower socio-economic status, the nucleus being formed usually by close or distant "poor relations". They will come to the head of the leading family for advice, for help in finding a job in the town, or for emergency relief in the form of a loan which is really not expected by either party to be repaid. Some of them will live in the household, which explains family sizes of twenty and above as observed in some surveys for the upper income groups. What the leader gets is a loyal following who will side with him in village rivalries, vote for him if he ever contests a local election, work on his fields or around the house when an unforeseen need arises, and at times (more in the past than at present) fight for him. He also gets, obviously, a sense of importance. Some of the followers may be his tenants—indeed in a situation of land scarcity allegiance may be the price one

must pay for tenancy. However, it is more likely to be the other way around—that one treats one's followers preferentially in the matter of leasing out land.

It is these factional groupings which dissipate class conflict on the one hand, and impede the accumulation of capital on the other. For the way to win prestige in the village is not by making immense quantities of money, but by enlarging one's follower group, and keeping them happy by a redistribution of his surplus. Nor is there room within this network of personal relations for introduction from the top (i.e., by the faction leader) of labour discipline or labour displacing technology. Thus there are no "markets" for land, or labour where the blind laws of supply and demand work out their inexorable and impersonal logic. Labour and land exchanges are embedded in more diffuse social relations.

Naturally, any government that needs to propitiate the countryside has to work through these *matbars* or *sardars*. For example, Bertocci [13] found at the time of his research (apparently 1967) that of 14 Basic Democrats from the area he was studying, 9 were *sardars* or from *sardari* lineages. Thus political or administrative penetration of the village would in the short run tend to strengthen the position of the *sardars*. They are the literate ones who can mediate between the villagers and the outside world.[10]

How would long term agricultural stagnation combined with a population explosion affect these structures? It is hard to say. As the average size as well as number of large holdings fall, and as the claimants to the surplus of the large holdings increase in numbers, this might increase the costs of patronage beyond what is considered reasonable by the *sardars*. On the other hand factions are likely to multiply, and this might help to absorb the rural poor at lower levels of living. This question is of more than theoretical interest. In inducing agrarian changes one of the decisions that has to be taken is whether to use traditional social formations or whether these have to be smashed before any far-reaching changes can be introduced.[11] On the other hand, the penetration of market forces is almost certain to prevail in the long run, over these inhibiting structures. This process is probably already underway.

V. STAGNATION AND CRISIS IN AGRICULTURE

For the Pakistan period, the story of Bangladesh agriculture is basically one of stagnation. The period can, however, be broken down rather neatly into two: the first, from 1949/50 to 1959/60, was one of complete stagnation, when output and value added failed to keep pace with population growth. The para-

[10]For a description of *matbars* in politics, see [43, pp. 20-30].

[11]For opposing views on the role of factions in Chinese politics, see [33; 38; 44].

metric growth rate of value added in agriculture was 0.66 [7, p. 40]. Rice imports went up substantially, and there was increased dependence on foreign (as opposed to West Pakistan) sources.

The second period, from 1960/61 to 1969/70, saw a definite improvement. The parametric growth rate of value added in agriculture was 2.93—almost equal to the estimated population growth rates. (However, as has been pointed out by Alamgir and Berlage, a linear equation yields a far superior fit for this period, implying a steadily declining rather than a constant compound growth rate.) Imports of foodgrains were brought down somewhat, at least till the middle of this period. Domestic availability per capita was better than in the previous period, though a downward trend is noticeable within the period.

Both these phenomena—the overall stagnation as well as the change in performance in the sixties—require explanation. We can only adumbrate certain possible causal factors, without trying to be comprehensive or offering detailed elaboration of the arguments.

Firstly, it must be remembered that the area that now constitutes Bangladesh has always been a backward area—a colony within a colony in British days, serving as the agricultural hinterland to the port city of Calcutta. In the days before the Second World War, it no doubt enjoyed some bucolic affluence, and had all the advantages of a backward rural area—low prices of food and unspoilt landscapes—which caused the emotional offsprings of comfortable landed gentry to wax lyrical about "Golden Bengal". But according to the Floud Commission, around 1940, 12.4 per cent of rural families lived entirely or mainly as share-croppers while another 18.6 per cent lived entirely or mainly as agricultural labourers. For this bottom one-third of the rural population, life cannot have been very pleasant even than (see [1, Appendix Table 5]).

Secondly, agricultural development would require either a sizeable group of large farmers who were interested in raising output and had the political muscle to influence government policy (given that government policy always plays a determining role in post colonial societies) or a government that is interested in such a development for its own purposes. The number of reasonably large farmers was small in East Pakistan, they were quite content with their existing levels of income (and would anyway find acquisition of land more attractive than improvement of it), and they could exert no pressure on a distant and alien government in Islamabad. This government in its turn had no very compelling reason to take an active interest in East Pakistan Agriculture. To them, for various reasons, growth meant industrialization, and industrialization was proceeding quite satisfactorily—in (West) Pakistan, of course.

The government's policies in fact were bound to frustrate any possible growth of commercial agricultural. In the interests of "primitive capital accumulation", agriculture was mercilessly squeezed. Tariff and export promotion policies were all designed to this end. The artificially low exchange rate benefited importers at the cost of exporters, and the primary exporters were of course in agriculture. The output and import of consumer goods were mainly of the types favoured by urban upper-income groups, and provided no incentive to small farmers.

Thirdly, peasant agriculture does have its technical and social limitations. The small size of holdings meant very little surplus to invest in improved techniques. Cooperative credit societies had become pliant tools in the hands of rich farmers who probably re-lent a good deal of the cheap loan so obtained—at low rates to followers, and at high rates to others.

The second decade saw some important changes in all this. Ayub Khan realized the importance of creating a stable base of support in the rural areas—partly as a foil to the increasingly turbulent urban elites. Also, ten years of agricultural stagnation had probably driven home some lessons about the importance of agricultural growth, if only as a precondition for industrial development. The system of Basic Democracies opened the eyes of the surplus farmers to new avenues that might be profitably explored, and the Rural Work Programme, with its emphasis on the construction of link roads, undoubtedly enlarged market areas, increased rural-urban contacts, and induced surplus farmers to grow and market more. An attempt was made to meet at least part of the credit needs of these "surplus" farmers—the National Cooperative Bank (1958/59), the ADBP (1961, now the Krishi Bank), and also, on a very small scale, the new cooperatives. The ADBP in particular was clearly involved in financing the expansion of the surplus farmers. It has been estimated that during the period 1965/66 to 1969/70, 14 per cent of ADBP loanees had holdings of 12.5 acres or more, and they received 40 per cent of all loans. It is also interesting to note in this connection that while the average annual flow of institutional credit to agriculture was Tk. 10.13 million during the period 1947/48 to 1957/58, in the period from 1960/61 to 1969/70, this went up to Tk. 120.03 million.[12]

Also to be remembered is the fact that in 1961 the ceiling on land holdings which had been fixed at 100 *bighas* (33 acres) by the East Bengal Tenancy and State Acquisition Act of 1951, was now raised to 375 *bighas* (about 124 acres) by the new regime. All told, the various measures adopted by the 'revolutionary'

[12]These figures are taken from an internal working paper of the Planning Commission.

government approximated the Stolypin Reforms, which attempted to promote commerical agriculture in Russia during the early decades of this century. This was the "elite farmer strategy" for East Pakistan and a great deal of subsequent political development followed from the fact that the strategy did not quite come off. The reasons why it did not have been touched on earlier.

An alternative to the elite farmer strategy was being worked on by Dr. Akhtar Hameed Khan at Comilla Academy which incidentally was founded in 1959. However, it is our impression that Comilla was tolerated as the whim of an amiable eccentric (and of course as a show piece) rather than seriously considered as pointing towards a real solution of a real problem.[13] The decision to adopt the IRDP on a national level was taken in 1970 —after the "Decade of Development" had distinctly turned somewhat ragged, prices of rice had registered significant rises in urban centres, expenditure on cereal imports had started rising, and after the events of 1968/69 introduced the peasantry dramatically into the arena of national politics. In March 1971 there were 23 IRDP Thanas in Bangladesh. The speed at which this number has gone up since liberation attests to the awareness of the present government regarding the agrarian problem. To what extent that problem can be solved through the IRDP is the question we shall try to confront. For this purpose it is necessary to take a close look at the successes and failures of the Comilla experiment.

VI. THE COMILLA EXPERIMENT

The Comilla programme of rural development and administration grew out of an examination of past failure in rural development. The Union Multipurpose Cooperative Societies and failed due to weak organisational structure and lax internal discipline. Rather than generate sufficient internal capital to become self-relient, the MPCS followed the path of the former cooperatives and became government channels for subsidised credit. The Director of the new Academy of Rural Development, establishment in Comilla in 1959, defined the task ahead in the following terms. "Economically the village is explosive, for socially the old leadership and the old institutions are now completely helpless. In some cases they have totally dissappeared. Introducing new skills and new implements and new methods will require a complete reorganization of the social and economic structure of the village.[14]

[13]This view was shared by Dr. Khan himself. According to him, the adoption of the Comilla Project owed something to the cooperation of his ex-colleagues in the Civil Service, who occupied important posts. "Their attitude towards me generally was. 'Here is a rather foolish person, but on the whole he is a good fool, and he should be humoured'; [29, p.22].

[14]Akhter Hameed Khan, "The Basic Principles of the Comilla Programme" A speech given at the Academy on 13 February, 1973.

The vehicles chosen to carry out this heavy burden is a network of cooperatives. The Comilla cooperatives were designed to avoid the weaknesses of the previous organisational attempts. A two-tier system was established: a number of village-based primary societies scattered throughout the thana, and a thana level central cooperative association located at Abhoy Ashram. This two-tier system offers several advantages. The village was considered to be the natural unit of development in rural society. And yet the village cooperative by itself would be considered too weak to stand on its own. The Central Association provides the servicing, training and supervised credit in support of the primary village society. Moreover, the Thana level organisation is close enough to the village societies to enforce the necessary measure of discipline which was lacking in the past.

In 1960 the Academy standardized the conditions a local society must meet to be a part of the Academy's new cooperative programme. In addition to choosing a chairman, the group should (1) organize itself and later become a registered co-operative society; (2) hold weekly meetings with compulsory attendance of all members; (3) select a trusted man from the group and send him to the Academy once a week for training (he should become the organizer and teacher of the group); (4) keep proper and complete records; (5) do joint production planning; (6) use supervised production credit; (7) adopt improved agricultural practices and skills; (8) make regular cash and saving deposits; (9) joint the central cooperative federation; and (10) hold regular member education discussions.

By these criteria the Comilla approach attempted to correct the fundamental weaknesses in the previous rural development efforts. Credit made available to village society was to be linked (a) to local planning and productive investment in new techniques; and (b) to a disciplined programme of internal capital formation through the purchase of shares and weekly thrift deposits. Moreover, rather than send "change-agents" from outside the society into the village, the Comilla approach stressed the need to organise and train leaders selected from within the society itself. Discipline therefore implied a slow and painstaking expansion of the village cooperatives in order to organise those sectors of the peasantry who would come forward with an interest in new productive techniques and the opportunity to gain and save capital. Close organisation, supervision and training were considered the key to avoiding the pitfalls of past cooperative efforts.

The "model farmer" soon emerged as one of the principal innovations of the Comilla approach. The "model farmer" system became operative in November 1971. The five distinctive features of the model farmer were (1). He is a resident of the village and serves his own society rather than an outsider who is responsible for a number of other villages as well; (2) he is selected by the

other members of a local voluntary cooperative group rather than by the Academy or some other agency; (3) He comes to the Academy one day each week for training, and so provides liaison between the farmers and the Academy; (4) he is one of a group of village farmers who as a unit serve as innovators; (5) he is trained by the Academy staff and advisors. This inversion of the traditional concept of the agricultural "extension worker' symbolised many of the innovations introduced by Comilla in the traditional relations between government and rural society. As a villager, the model farmer was thought to enjoy the confidence necessary to guide the local people which appointed government agents never could.

The other obligations required of the farmer related to capital formation and savings. The farmer is required to buy a minimum of one share of Taka 10 upon becoming a member and to save at least 50 paisa per week and hand it over to the manager of his cooperative in the weekly meetings. Credit is provided only to members against the security of mortagage of land. The amount of the loan generally relates directly to the area of land offered for mortgage. All those members of a cooperative who wish to make these loans produce a joint application to the Agricultural Cooperative Federation (ACF) and submit a production plan. The rate of interest on these loans is 15 per cent. The Central Association gets 7 per cent. Two per cent goes to the common fund of the village cooperatives. Five per cent is kept as Service Charge to support the administration of credit. The remaining one per cent is paid to the manager of the primary society as an incentive in the collection of loans. The farmers need not therefore leave the village to get their credit which is one of the most attractive features of the system. The whole procedure from initial application to final delivery of the credit takes about the month.

There is no doubt that the Comilla experiment was a success in terms of raising output. A study by Mr. Akanda of the BARD (cited in [24]) reveals the following :

TABLE V

Districts	Yield Per Acre (tons) Average of 5 Years Ending in		Percentage Change
	1966/67	1971/72	
Comilla	0.44	0.53	+ 28.75
Chittagong	0.52	0.64	+ 23.32
Mymensingh	0.41	0.42	+ 12.98
Faridpur	0.32	0.31	- 1.81

Source : [24, First Appendix Table].

Similarly, a comparative study of sample cooperative farmers in Comilla (Kotwali) thana and sample non-cooperative farmers of the neighbouring thana of Chandina shows that between 1963/64 and 1969/70, the cooperative farmers improved their position in terms of many different indices. Details will be found in Appendix Table III.

The following table shows progress made in irrigation in Kotwali Thana.

Provision of irrigation permitted expanded cultivation of winter crops. From 1966/67 to 1969/70, area under winter crops increased from 7,053 acres to 12,975 acres. This was accompanied by a drastic shift away from local varieties of winter rice to the new high-yielding varieties. The acreage under IR-8 alone exceeded, in 1969/70, the total acreage under all winter crops in 1966/67, being 7,446 acres. Acreage under local varieties fell from 3,855 to 1,119 [4, Table 42, p. 40].

TABLE VI

Years	No. of Pumps	Area Irrigated	No. of Tubewells	Area Irrigated	Total Area Irrigated
	1	2	3	4	(2+4)
1965/66	4	178.3	25	1,127.3	1,305.5
1966/67	17	726.5	46	2,350.4	3,076.9
1967/68	37	1,292.0	91	3,891.5	5,183.6
1968/69	67	2,323.1	126	6,204.1	8,527.2
1969/70	110	3,260.4	168	8,000.7	11,261.1
1970/71	93	4,109.4	194	11,071.6	15,181.0

Source : Upto 1969/70, [42, Table 28, p. 28; for 70/71, 12, Table 8, p. 70].

S.A. Rahim and M. Shamsul Islam have made some estimates of the impact of new varieties on the production and income of individual families [41, p.7]. On the basis of a study of cooperative members interviewed in 1963 and again in 1969 the authors came to the following conclusions. (1) The average production of paddy per family increased from 49 mds. in 1963 to 95 mds. in 1969. This increase was exclusively due to higher intensity of land use and better yield per acre of land cultivated. (2) The amount of paddy sold per year per family expressed as percentage of total paddy produced increased from 11 per cent in 1963 to 25 per cent in 1969. (3) The average annual cash farm-expenditure per acre of land under cultivation increased from Taka 111 in 1963 to Taka 393 in 1969. The increase is primarily due to the cost of additional labour and new inputs. (4) The average amount of liquid assets owned per family increased from Taka 281 in 1963 to Taka 1412 in 1969.

In a study of Comilla Kotwali Thana farmers for the years 1966, 1969 and 1972, Malek [34] found that for all size classes, cooperative members outperformed non-members in terms of (i) proportion of owned land put under *boro* cultivation (ii) use of insecticides, and to a lesser extent of fertilizer, and (iii) the yield per acre obtained (with the exception of 1972, when among his "medium farmers", the non-members had a higher yield). However, he also found (i) that the percentage of respondents using HYV seeds was by 1972, higher for non-members in all but his "large farmer" group, and (ii) that by 1972, the large farmers among the members were obtaining higher per acre yields than small or medium ones. (It must, however, be pointed out that his "large farmers" are those owning more than 3.33 acres of land.)

The above enumeration is by no means exhaustive, nor has it taken account of the cost involved. It must also be borne in mind that the success of Comilla depends partly on the very fact that it was an isolated example, a small experimental area where research, money and administrative skills could be concentrated. Duplication might well run up against steeply rising supply curves for these resources, particularly for extension workers with the requisite amount of zeal and dedication. National level organizations are notoriously prone to bureaucratization, with attendant red-tapism, hardening of controls and loss of local initiative and participation.

Even the original small-scale model has important deficiencies to which it would be foolish to turn a blind eye.

The fundamental weakness of the Comilla approach is that it does nothing directly for the small or landless farmer. Membership is restricted in practice to farmers operating at least half an acre of land. Clearly the landless would in any case have no interest in joining, since they need neither tubewells nor improved seeds, and are not likely to be good credit risks, or to have any "productive" use for credit. What Akhtar Hameed Khan has to say about the Works Programme aspect of the Comilla experiment has wider applicability:"...it was by no means a panacea for the misery of the landless. Nor was it, as I have recently heard, an attempt at redistribution of incomes...it could neither furnish full employment nor lesson the disparity between owners of land and hired hands. In fact, better drainage, link roads and irrigation substantially enhanced the value of land and its rent. The unearned increment of the landowners was a hundred times more than the wages earned by the labourers. Even an elementary student of economics should know that it would be so as long as ownership is not transformed. I did not tout the Works Programme as instant socialism" [27, available copy lacked pagination].

The landless labourers would, however, derive some indirect benefits if as a result of the extension of irrigated acreage and of changing cropping patterns, labour requirements went up, thus increasing employment, or wage rates, or both. Providing some employment in the traditionally slack winter season would at least help to smooth out seasonal fluctuations in earnings. Expanding winter acreage would certainly expand employment opportunities in winter. And there is evidence that the high-yielding varieties of rice do require more labour. According to a study by Hoque, one acre under IR-8 requires 74 man-days at different stages of operation. Local *boro* requires 53.6 man-days, and local *shaitta* only 38.5 man-days. Citing this and other studies, Iftekhar Ahmed concludes that "(1) Over all labour requirements per acre under IR-8 is found to be over 94 per cent higher than the native variety. (2) For every additional acre brought under cultivation of IR-8 rice 500 man-hours of additional employment is created over the native variety. (3) At every stage of operation labour requirements increase". [4, p.6, punctuation as in the original].

Some qualified support is also given to this presumption by data on money wage rates per day in different districts.[15]

TABLE VII

Districts	1967	1968	1969	1970	1971
Dacca	2.88	2.82	3.01	3.49	3.57
Mymensingh	2.69	2.74	3.33	2.79	2.79
Faridpur	2.37	2.52	2.55	2.35	2.78
Comilla	2.75	2.63	3.07	3.32	3.19
Rajshahi	2.80	2.88	2.97	2.95	3.20

From Table VII (or from Figure 1, which presents the same information graphically) we see that money wages rose fastest in Dacca, followed by Comilla. Dacca would be a special case because of the impact of the metropolis in relieving surplus rural labour. It must also be remembered that these are money wage rates, and the rise in prices of consumer goods including rice, must have been faster in Dacca.

Again, Figures 2 and 3, based on data presented in Appendix Tables IV and V, reveal that while in 1967 the month-to-month variation in daily wage rates was quite high in Comilla, in 1971 it was about the lowest, again with the exception of Dacca.

[15] I am indebted to Dr. S.R. Bose for allowing me to use these data, which have been collected by him for an extension of his earlier poineering work on rural wages.

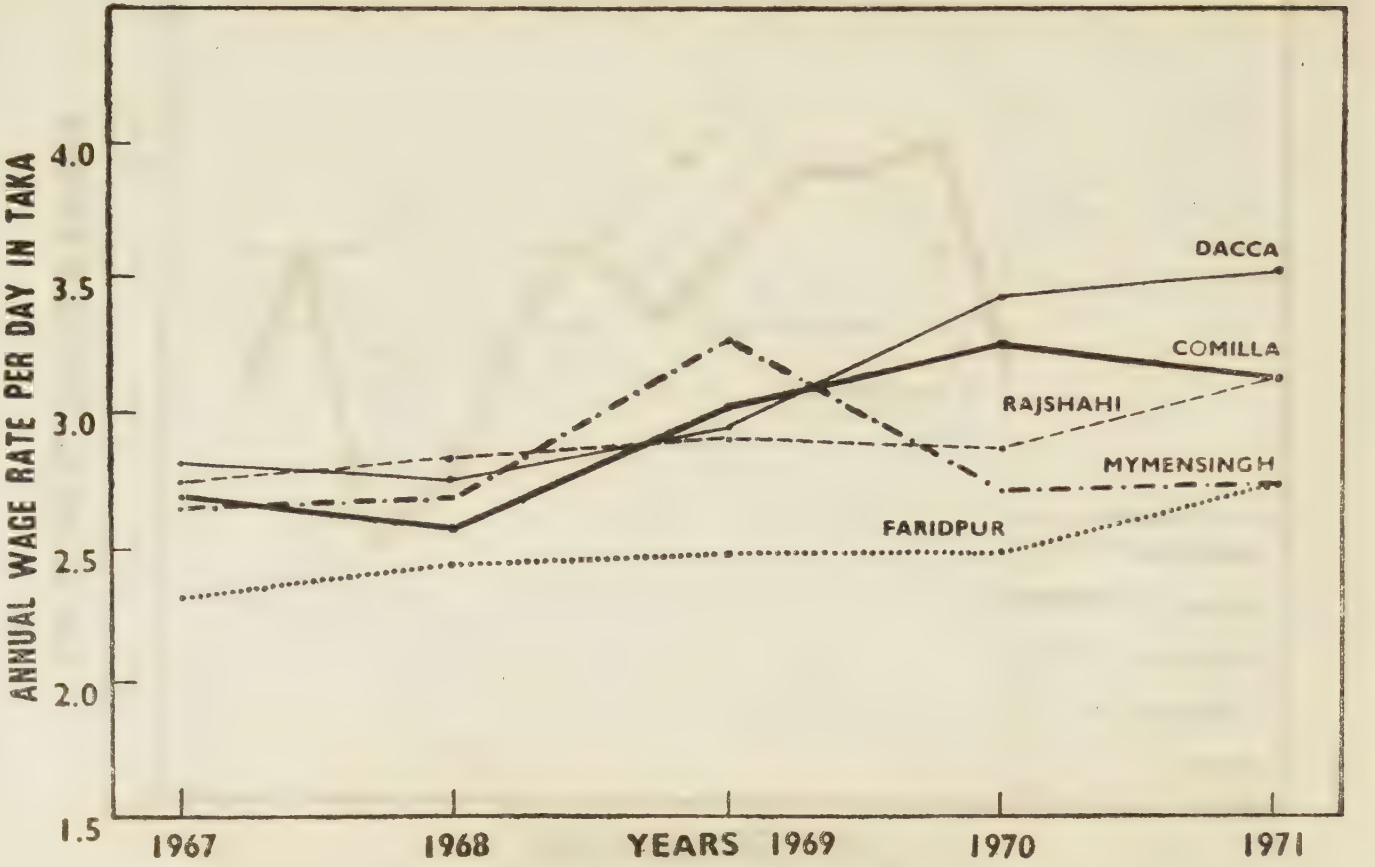

AVERAGE ANNUAL WAGE RATE PER DAY IN TAKA IN THE YEARS 1967 THROUGH 1971
ANNUAL WAGE RATE PER DAY IN TAKA
4.0
3.5
3.0
2.5
2.0
1.5
1967
1968
YEARS 1969
1970
1971
DACCA
COMILLA
RAJSHAHI
MYMENSINGH
FARIDPUR

Figure 1

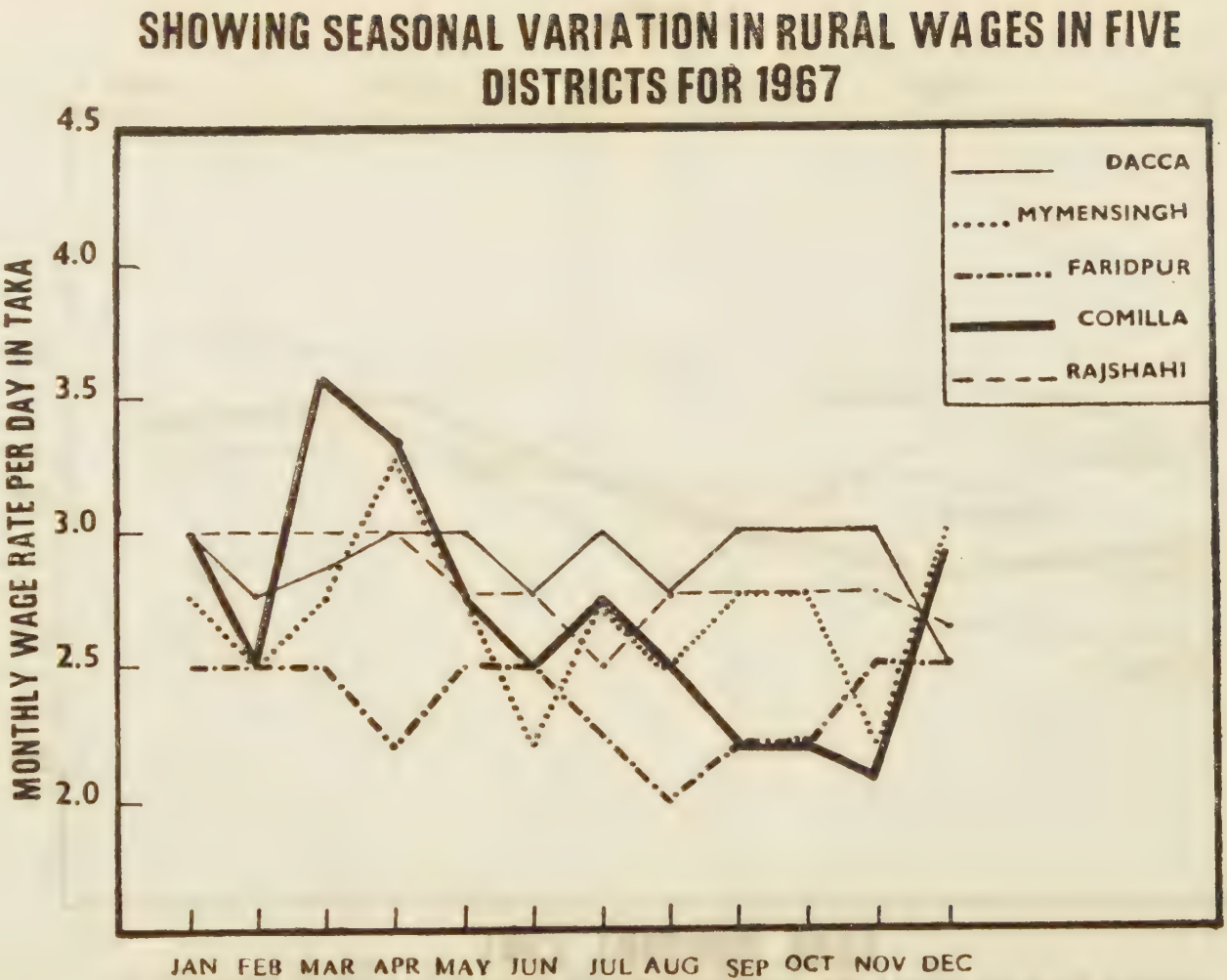

SHOWING SEASONAL VARIATION IN RURAL WAGES IN FIVE DISTRICTS FOR 1967
MONTHLY WAGE RATE PER DAY IN TAKA
4.5
4.0
3.5
3.0
2.5
2.0
DACCA
MYMENSINGH
FARIDPUR
COMILLA
RAJSHAHI
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC

Figure 2

SHOWING SEASONAL VARIATION IN RURAL WAGES IN FIVE DISTRICTS FOR 1971

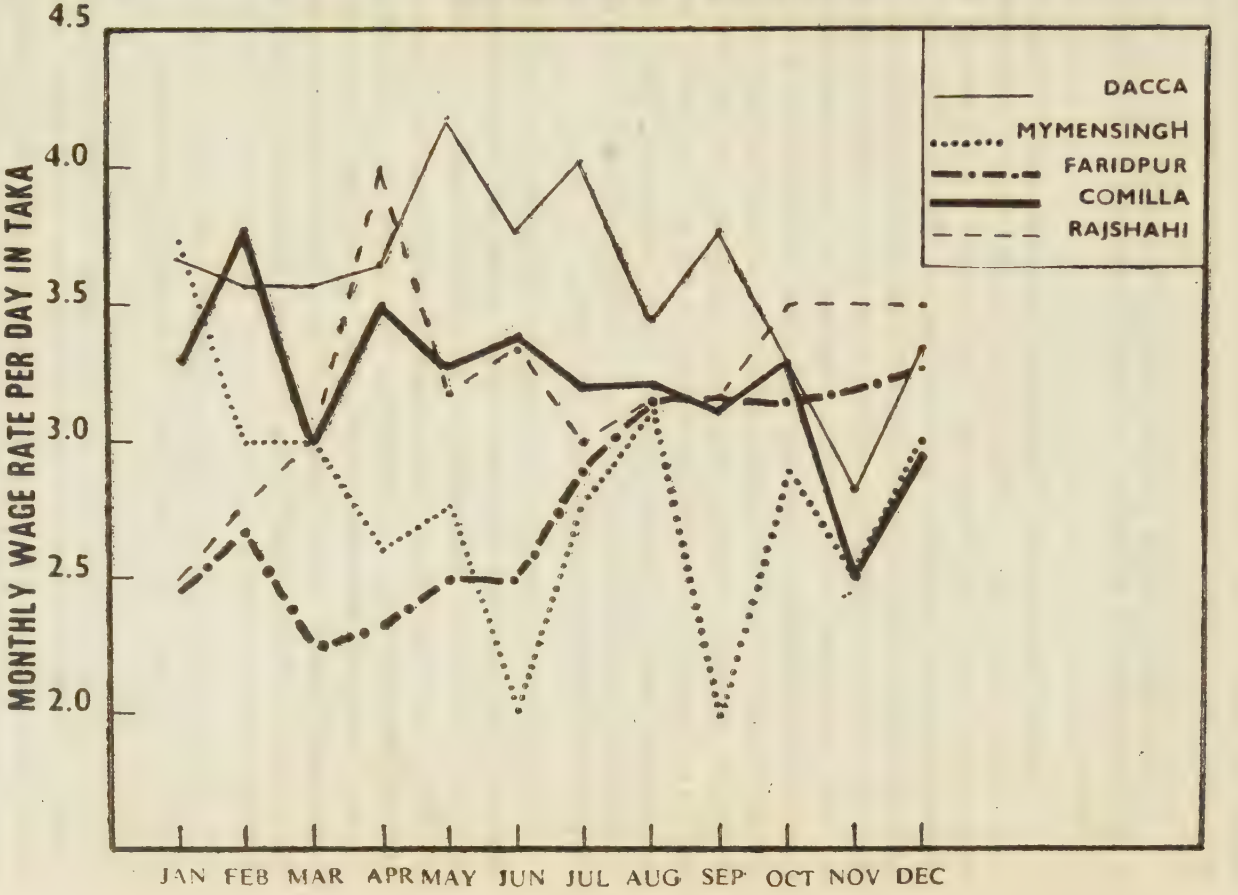


Figure 3

None of this is conclusive, of course. There may have been many reasons besides the spread of the cooperatives why a relative labour shortage developed in Comilla. But as *prima facie* evidence it may hold out hopes.

However, there are other ominous signs that the Comilla-type cooperative is again being infiltrated and turned into tools of domination by the relatively well off farmers.

A study of 32 managers of village cooperatives, as reported by Mannan [35, Table 3, p. 14], shows that 17 of them held more than 5 acres of land, another 8 held between 3 and 5 acres, while only 7 held between 1 and 3 acres of land. (None held less than one acre or more than 9 acres.) The average size of their holdings was 5.06, whereas the average size of holdings in Comilla Thana is 1.86 acres [35, p. 14]. In a study of four successive managing committees of the ACF, it was found that, of 12 elected members in each committee, the number having farming as their only occupation fell gradually. It was 8 in the first committee, 5 in the second committee, 3 in the third committee and 2 in the fourth. Those who were farmers as well as contractors, on the other hand, had no representation in the first committee, but they were in a simple (though not absolute) majority in the last committee, with 5 members [3, Table 4, p. 37]. It should be mentioned that contracting is a full-time job, and if these people were farmers they must have been very casual ones.

In a study of societies which had defaulted on loan repayment it was found that 47.42 per cent of the loans were utilized to release mortgaged land, 8.07 per cent for buying land, and another 3.67 per cent for leasing land [29, Table 14, p.42]. It was also found that managing committee members were getting an inordinate share of total loans. Of 30 members who responded to a questionnaire, 11 were managing committee members, and they consumed 65 per cent of all loans issued to these 30 [29, Appendix Table 7, p.67]. Sixty seven per cent of the overdue loans were defaulted by Directors of Managing Committees [29, Appendix Table 14, p.74].

Since none of the managing committee members mentioned earlier had more than 9 acres of land in their possession, it would clearly be misleading to say that the surplus farmers are taking over the cooperatives. What we seem to be witnessing is a further differentiation among the middle (self sufficient, not surplus) farmers, this time with respect to function rather than landed wealth. Perhaps the surplus farmer does not yet feel threatened, as he might if the Comilla experiment really were to be replicated nationwide. Again, Akhtar Hameed Khan's diagnosis and warning should be kept in mind : "Neither were we surprised when the bigger capitalists—the large proprietors, money lenders and traders—tried to

capture this potentially dangerous movement. Initially we worked quitely round them, suggesting not that they should be excluded from the new cooperatives, but that they should not be allowed to dominate, as they had dominated the old cooperatives. It was no easy job...The rural elite, hand in glove with the urban elite, wielded great economic and political power. It was going to use that power to defend its privileged position" [27]. The time may soon come when "working quietly round them" will no longer be possible. Future development would then depend on the responses government will make and the transformations it will undergo under the strain.

The IRDP later picked up these principles of the Comilla programme to expand agricultural cooperatives to a far broader area of the country than their original home in Comilla Kotwali Thana. The IRDP combined the Comilla approach with the elements of a number of other development programmes and objectives, notably the Thana Irrigation Programme, which we now review.

VII. THE THANA IRRIGATION PROGRAMME

The Thana Irrigation Programme was initially launched as another critical element in the overall rural development strategy. The programme began in 1966/67 on a pilot basis in 10 Thanas, and was extended throughout the whole country in the following year. The team of officers of various government agencies at the thana and district level and Local Government Councils were responsible for implementation of this programme.

The programme has made a significant impact on the agricultural life of Bangladesh. In 1972/73 the programme covered 352 Thanas with 30,887 power pumps irrigating approximately 11,10,500 acres of areas; 2,204 deep tubewells had been sunk irrigating 35,624 acres, while over 1,420 more tubewells were commissioned; and 2,601 shallow tubewells had be en sunk irrigating approximately 9,330 acres of area [18, p.39]. Ninety four per cent of the area irrigated was sown in Irri *boro*, i.e., 1087 million acres. As of 1970/71 the cooperative department has registered about 70 per cent of the irrigation groups as agricultural societies. About 40 per cent of the total members of the irrigation groups joined the cooperative. About 70 per cent of the cooperative members received short-term loans at the rate of Taka 215 per loan. And the total amount of loans distributed by the cooperative department was Taka 28 million [41, p.5].

The Thana Irrigation Programme was however, founded on a temporary organisational structure. The disjunction between the command area of the

irrigation pump and the average size of the family farm in Bangladesh compels cooperation among a number of farmers—27 is the TIP average—and the village based primary agricultural society, the Krishi Samabaya Samity (KSS), innovated by the BARD, was linked up to the TIP as its institutional base. These groups could apply for credit from the Cooperative Bank at a rate of 9 per cent per annum. Thus provision of credit was linked to productive purposes for the first time through an agricultural society. These TIP's therefore became the forerunner of the IRDP cooperatives to be introduced later.

These TIP cooperatives however remained loose organizations since they were organised primarily around the limited purpose of the distribution of irrigation water only four months out of the year. Although one element of the Comilla programme, linking agricultural credit to productive purposes, was incorporated in the TIP, the equally important discipline of internal savings, regular meetings, and continuous training were foregone. Rapid expansion was the predominant consideration. In view of the critical importance of irrigation technology for output growth as well as for organization and equity, we examine below the experience of some pump groups.

VIII. PUMPS AND TUBEWELLS

Clearly a key element in the whole situation is the nature of the irrigation technology adopted—in this case 2-cusec pumps and tubewells—and its interaction with the milieu into which it is introduced. It is important to find out how this vital piece of hardware is functioning both in purely economic and in social terms.

Large irrigation projects have many drawbacks in countries like ours. A major problem is that of making the recipients pay, and denying access to those who do not pay. A second problem is that there may not be enough demand for the water to justify the outlay. Long gestation periods also reduce their present value. The problems of operation and maintenance, particularly the second, may also prove formidable, since the technology involved is highly sophisticated. This also means that one of the desirable social consequences of irrigation—a feeling on the part of the producers that their control over nature has increased—is likely to be absent. The huge dam with its incomprehensible gadgetry becomes in effects another force of nature—a more benevolent one, perhaps, but equally beyond their own control.

The 2-cusec pumps (from now on we shall use "pump" to mean both low-lift pumps and deep tubewells) is a compromise solution that is both technically efficient and at the same time permits direct control by farmers. It has been

argued that it is superior to larger pumps even on purely technical grounds, because of the high channel loss through seepage which increases the cost of water delivered to the field for larger pumps, even though the cost of water pumped may be lower [17]. However, it has also been argued that channels should be lined anyway, because a lined (*pacca*) channel can be much narrower and therefore save land. No definitive cost-benefit analysis has been made to decide between the two alternatives. Our opinion at the moment is that it was the organizing principle—providing irrigation through organizing local groups—that was decisive in this particular choice. Larger pumps, requiring the cooperation of many more people than are habitually found in pump groups currently, would have run up against social difficulties of all kinds. There would be the problem of keeping rival factions together (though it may be argued that in fact this would have been a good way of fighting factionalism), also the problem of a lower degree of face-to-face communication among members and therefore a feeling of alienation. A tendency might have emerged to leave things entirely to the managing committee, while failing totally to try and control them. Indeed, even with a 2-cusec pump, the problems are not entirely absent.

The Planning Commission offers the following estimates of benefit-cost ratios for different types of irrigation project.

TABLE VIII

Type of Irrigation Project	Benefit-Cost Ratio	Percentage of Annual Cost Recovered from Farmers
Low-Lift Pumps	8.1	23
Shallow Tubewells	6.6	34
Deep Tubewells	5.1	14
Large-Scale Projects	4.3	0

Source : [19, p. 150].

Apparently shallow tubewells are the second best performers in terms of benefit cost ratios and best in terms of percentage of costs recovered from farmers. The Plan unfortunately does not provide an explanation of its methodology, so that we cannot say how reliable these estimates are. Nor is it clear from the plan document why the emphasis has not been shifted to shallow tubewells. One possibility is of course that water depths are not suitable for shallow tubewell development over extensive areas. One could think of other reasons that have less to do with purely technical considerations.

A reasonably comprehensive cost-benefit analysis will have to take account of many variables. Some of them are:

a) The cost, capital as well as current, of a pump will depend on its make, its age, the depth at which usable groundwater is available, and also on soil type, actual cropping patterns, normal precipitation etc., since these will determine the number of hours for which the pump will have to be operated;

b) the benefits will also depend on the factors named last above. Indirectly they will also depend on available markets for surplus product, and on the postulated reaction of farmers to the availability of irrigation water;

c) to evaluate a complete programme, one would thus need to know (i) how many pumps are going to be fielded, and their precise location; (ii) the age and type distribution of pumps; (iii) anticipated probability of breakdown, dictating the number to be kept as buffer; (iv) water response functions for various crops; and (v) the cropping patterns anticipated to emerge. Clearly a very tall order.

We do not propose to go into these matters here, important as they are. We simply want to see how well the existing pump groups are operating. The criteria used will be (1) capacity utilization, and (2) distribution of benefits. The second is further subdivided into (a) whether members of pump groups tend on the average to be from the upper strata, or at least to be biased against the lower strata, and (b) whether within the pump groups, the benefits tend to accrue disproportionately to some particular groups.

Area irrigated per cusec has been declining over the recent years, according to data from the BADC. For example, from 24.69 acres per cusec in 1965/66, it came down to 19.50 in 1970/71. Since technically a 2-cusec pump should be able to irrigate 60 to 120 acres, with the mean probably around 80-90, the current area irrigated represents, at a conservative estimate, less than half capacity utilization. As a matter of fact these data probably overstate area irrigated. One study [5] found large discrepancies between the area cropped as reported by BADC and the actual area cropped in certain selected areas. According to the same study, the capacity utilization rates varied from 10 per cent to 68 per cent in 32 areas studied, with an average of perhaps 25. Various possible reasons can be cited for this low rate of utilization. What is more difficult is to assign relative weights to these various reasons.

(1) Late delivery of pumps. For the *boro* crop the pumps should be on the spot by December. (It will vary from area to area and depend on crops grown.) In an evaluation of the pump programme made in 1969 [37], it was found that

only 47% of the sample groups had received pumps by December 1968. However, by January 88% of the pumps had been fielded.

(2) Inadequate supply of POL. This again seems not to have been a great problem in 1973/74. However, in 1968/69, 47.3 per cent of groups sampled cited this as a problem.

(3) Breakdowns, lack of spare parts and mechanics. This was felt to be a problem, at least potentially. It was also felt that damage was sometimes caused by the driver, who collaborated with others to adultrate the fuel oil, thus saving some fuel for private profit.

(4) Scarcity of water. As the upper limit to the expansion of pumps is being reached, more and more new pump groups are being set up in areas where hydrological conditions are unfavourable. In this connection some findings of the report cited above are noteworthy: 21 groups in the year under study failed entirely. (This represented, however, only 2.3 per cent of the total sample.) Of these 11 failed due to shortage of water. (Another 5 failed due to disintegration of the group. Presumably we are again being haunted by the spectre of factionalism.)

(5) The low rental charged. Obviously when the charge is far lower than the social opportunity cost, too much of the factor (in this case pumps) will be used. This comes about in two ways: (a) groups which because of unfavourable topographical and hydrological conditions, have a social benefit cost ratio of less than one, would still want a pump since at the subsidized rate the benefit cost ratio to farmers is greater than one; (b) even where topographical conditions are favourable, the first entrants to a group have no great incentive to increase coverage—they may obtain enough POL to irrigate sixty acres, but irrigate only twenty, thus on the one hand saving some fuel which they can sell on the open market, and on the other, by running the pump for fewer hours, minimize the probability of a breakdown.

On the second question available evidence is thin. According to another survey [10, Appendix B III], members of TIP groups cultivated on the average 6.66 acres of land, of which 6.32 acres was their own land and the rest taken in on *barga* (share-cropping). Of this total cultivated, 2.02 acres were under the TIP while 4.64 acres were outside it. It is also interesting to note that members who cultivated own land only brought 28.7 per cent of their total land under the TIP, while members who also cultivated some share-cropped land managed to raise this percentage to 39.1. Members cultivating own land only were larger farmers—their average holding size was 6.92 acres, of which 4.93 acres were outside the TIP, and only 1.99 under the TIP. Members cultivating both own

and *barga* land had a total cultivable holding of 5.50 on the average—(owned 3.69 acres), of which 2.15 acres were under the TIP.

From the above it would seem that in 1968/69 (the year in which the programme was launched), the average TIP member was recruited from the upper strata of rural society. Most of them (104 out of a sample of 128) were rich owner farmers. The remaining 24 were owner-cum-share-croppers, who tried to compensate for their relative poverty by share-cropping on irrigated land.

The evaluation report which we cited earlier also gives some interesting facts about the managers of pump groups. It was found that out of 186 group managers, 83 (45%) owned land between 5 to 33 acres; 93 (50%) between 1 to 5 acres; and 10 below 1 acre. One-third (64) had their own radio sets.

It would seem pretty evident that at least in the beginning the pump groups were organizations of the rich farmers, by the rich farmers, and for the rich farmers. Has the picture changed since then?

Data for 1973/74 on five pump groups in Rajshahi, and 15 pumps, 6 deep tubewells, and 8 shallow tubewells, all in Kushtia district, are presented in Appendix Tables A-6 to A-9. The Rajshahi data are very interesting. They reveal very clearly a domination of the pump groups by farmers with 7 acres or more of land. Except for the group identified in the tables as DTW5,[16] these large land-owning groups constituted at least 20 per cent of the members (the highest is 37 per cent for group 3), their share of total land owned by group members varied from 63 to 74 per cent, and their share in land irrigated by the tubewell from 56 to 69 per cent. The last fact in Particular should be noted. This is usually disguised by looking at the ratio of irrigated to owned land, which almost invariably shows larger farmers irrigating a smaller percentage of their land. This is only to be expected, since the smaller one's total landholding is, the larger the the percentage of that land that is likely to fall within the command area of a pump. (It would be extremely interesting to find out whether larger landowners also tend to be members of more than one pump group.) This does not alter the fact that most of the irrigated land belongs to the large farmers.

For two of these tubewell groups, it has been possible, from the original returns, to get some idea of the element of kinship dominance in these groups. It was found for these two that two kinship lineage, the *mondols* and the *pramaniks* (or *paramaniks*) were dominant in both these groups. The results are presented below.

[16]This was apparently a problem group, which was delivering water only to 22 out of 53 members.

TABLE IX

DOMINANT KINSHIP LINEAGES IN TWO TUBEWELL GROUPS, RAJSHAHI

Groups	Lineage	Members	Percentage Land Owned	Area Irrigated
I	Mondols	26.9	35.6	22.25
	Pramaniks	50.0	39.7	60.77
	Both	76.9	75.3	83.02
IV	Mondols	17.9	29.3	31.0
	Pramaniks	17.9	10.1	13.4
	Both	35.8	39.4	44.4
		3/54		

For group 4 it is perhaps misleading to speak of dominance. Perhaps if all the members could be classified into lineages, it would be found that these so called dominant lineages are in fact average or less in terms of the three criteria used above.

Some limitations of the data should be pointed out.

1) The discerning reader will note the clustering around integral values for reported land ownership. People in the group 2.00–2.99, for example, are mostly people reporting 2 acres. Clearly, as innocuos a change as using intervals with lower limits excluded (e.g., "more than 2 and upto 3 inclusive" rather than "2 and upto less than 3") would cause a change in the percentages. In particular, since people with exactly 7 acres would be moved down, all the percentages (membership, area owned, area irrigated) for the "7 and above" group would be scaled down somewhat. However, the change would not be very great, since the people with 7 or more abus mostly had considerably more than 7 a cres. Of course, this marked preference for round figures is suspicious in itself. Partly no doubt this is genuine ignorance, partly the vagueness born of illiteracy, partly perhaps distortion.

2) It should be noted that "area irrigated" includes area leased in on some arrangement, usually share-cropping.

3) There is a discrepancy in al[illegible] cases between reported total area irrigated and the sum of area irrigated by individual members. The difference could be either a measure of the underreporting by members, or some irrigation water being supplied to non-members.

The data on the Kushtia groups are less comprehensive, and not much can be deduced. Certainly farmers below 2.5 acres seem to dominate the membership here, while people with 10 or more acres are practically totally absent. One would have liked more detailed information on the rather wide middle range of 2.5 to 10 acres. Still, it seems to be a reasonable conclusion that in Kushtia access to pumps is more egalitarian, and also that this is more so for shallow tubewells than for the larger units. This is evident, for example, from the fact that for low lift pumps, and to a lesser extent for deep tubewells, the managers have a much higher average amount of irrigated land than ordinary. This tendency, while not totally absent is much less prominent for shallow tubewells—highlighting perhaps one of the major social advantages of small groups.

This in turn does raise some questions about the current strategy for cooperative development. A rapid spread of shallow tubewells might loosen one of the tightest bonds that cements a primary co-operative society together. Those societies that were being held together mainly by this bond against internal fissiparous tendencies might disintegrate. This might of course not be an undesirable development at all.

Pending further detailed research, we must leave this whole discussion some what up in the air, with some such tentative conclusion: the relatively affluent farmers do tend to dominate irrigation groups. However, the extent of this domination will depend on (i) the extent of land polarization in the region, and (ii) the size of the capital equipment involved.

A few concluding words on the subsidy programme may be in order. It has been estimated that if the present policy is maintained, total subsidy over the Plan period will amount to Tk. 1,320.13 million. Even if the plan proposals are enforced, this will amount to Tk. 739.16 million. The basic problems are: who pays for any subsidization scheme? Who obtain the greatest benefits from the scheme, and conversely who would be most hurt by the withdrawal, in part or in full, of the subsidy?

A full analysis of this problem would be exceedingly complex. We can do no more than outline some of the major interrelations that must be kept in mind.

If all producing cultivators get subsidized irrigation water, they all benefit in proportion to the amount of land irrigated by them. Some of the benefits may be passed on to the consumers in the form of prices lower than they would have been in the absence of subsidies. This would depend on demand and supply conditions on the product market. However, if all agricultural producers are more or less subsidized, somebody has to be taxed to pay for this—except to the extent that (i) foreign aid can fill the gap or (ii) the subsidy finances itself by

import-substitution or export-promotion. This taxation will have to fall on sectors that have some income to tax but are not politically strong enough to resist taxation. Or the taxation may be hidden, through inflation that affects different classes differently.

We have argued that withdrawing or at least reducing the subsidy will cause fewer pumps to be demanded and at the same time result in higher capacity utilization. The net result may or may not be (i) a curtailment of total output, and (ii) a rise in cost and therefore price per unit of output. At a higher cost of irrigation water, it would pay the nucleus of a group to try and expand coverage. But they could do this only if at the enhanced price there are enough buyers for water. Current rice prices do make it likely that in fact the demand for irrigation water is fairly inelastic for realistic price changes. And yet the feasibility of such a scheme will not depend simply on the pure economics of the situation. A strong farmers' lobby, that cherished dream of the IRDP, is already more than embryonic. Politics, therefore, may find itself in command, though not quite in the sense in which that phrase is usually used.

IX. THE IRDP

By the end of the sixties, therefore, the government's assault on agricultural backwardness had fielded a respectable number of programmes and agencies. And yet, the lack of coordination and centralizing purpose was all too abundantly clear. The early years of the decade were marked by a broad strategy of the RWP to convert the necessity of foodgrain imports under P.L. 480 into a massive rural public works which would both provide the infrastructure for extending market relations in the rural areas, as well as absorb the expanding reservior of agricultural wage labourers. No real effort was made to engender any mass participation in local development planning, and the link between the bureaucracy and local government gradually transformed development resources into wasteful patronage.

The advent of High Yielding Varieties in the mid-sixties promised a dramatic increase in rice production and the possibility of eliminating foodgrain imports, although at the price of a thorough revision of development strategy. Mechanized irrigation had to be implanted in Bangladesh agriculture and administration geared to channeling the new inputs to the farmers. The rapid extension of new productive means became paramount, and this intensified the tempo of administrative involvement in agriculture. Meanwhile, however, a corresponding emphasis on institutional arrangements never developed, on a nation-wide basis.

The old Multipurpose Union Cooperative Societies had proved little better than their predecessors in linking credit to productive purposes in agriculture;

the programme moreover, failed to reach the lower and more credit starved layers of rural society. The Comilla project which was initiated in the early sixties to correct these shortcomings remained an 'experiment' in the Kotwali 'laboratory' when the national development priorities were overtaken by rice intensification. Thus the Comilla principles of discipline, self-reliance, and internal capital formation were forgone under the urgency of the Thana Irrigation Programme which relied on a quasi—cooperative structure to share a pump, encouraged by easy credit. The relation between the correct development strategy and the appropriate institutional framework remained at best haphazard.

Thus the pressure for agricultural development certainly increased during this decade. But the staggered and uncoordinated development of policies and programmes resulted in three distinct approaches to the rural areas. The RWP coordination of local government and administration around massive public works, the Comilla experiment in self-reliant cooperatives, and the Accelerated Rice Production Programme (ARPP) and TIP stress on rapid increase of production-which often worked at confused, if not cross-cutting pruposes. The inability to coordinate these programmes meant that development remained, by and large, a force directed top down from the government without any compensating stimulation of local institutions to ensure mass participation. It was in the last year of that decade that the Integrated Rural Development Programme was initiated in order to establish the necessary coordination. However, the progrramme did not take clear shape until the Liberation War had itself reworked the social and political environment of development policies.

The Liberation War brought about two basic changes in the direction of development policies. First, the emphasis on "growth" which dominated Pakistani policy without regard to the issues of regional and social distribution was corrected by the new Bangladesh state through its "socialistic" emphasis of "distributive justice". Moreover, the local government apparatus of Basic Democracies was abolished which had provided the under-pinning to link the administration to rural society. The Rural Works Programme and Circle Officer (Development) were now left suspended in a vacuum. Thus both the policy emphasis and the institutions which favored the traditionally established sectors of the rural society were in decline after the Liberation Priod. It was in this context that the IRDP stepped in to coordinate local development administration around the growth of Comilla-type cooperatives throughout the country.

The IRDP's criteria for selection of thanas pointed towards areas where previous programmes had already begun [25, p. 350].

a) Thanas of the cyclone affected areas to provide institutional support to the rehabilitation programme in general and the Special Agricultural Mechanization Project and other Special Projects in particular.

b) Thanas where TCCAs have been formed outside IRDP with local initiative.

c) Thanas where concentration of power pumps and tubewells already exists under the Thana Irrigation Programme (TIP) acting as nucleus for the irrigation groups—Krishi Samabaya Samity (KSS).

d) Contiguity of thanas as far as possible for intensive efforts and better supervision and coordination.

e) An even spread in as many districts as possible for demonstration effects on other thanas which would eventually be covered by IRDP support in future areas.

f) Thanas where farmers are comparatively advanced in the use of modern inputs and technology in agriculture.

The IRDP's chief agent in the areas it selects, is the Project Officer, who with his assistant is confronted with two initial tasks; (a) from the villagers into cooperatives; and (b) organise the village cooperatives into a thana level federation. The latter functions as a supporting institution for the village societies and arranges such essential services as supervised credit, training for the local leaders, agricultural extension, and input planning and distribution. The IRDP has thus selected those areas where intensive agriculture is already under way, or where cooperatives have already been formed under local initiative. Its main purpose then is to lay the institutional framework for stable and self-reliant cooperatives according to the Comilla principles of linking credit and training to productive investment and internal savings. This relation between the Comilla cooperatives and the previous programmes however raise some difficulties.

The cooperatives, gain their broad appeal to the rural farmers when combined with the more productive technology of controlled irrigation and the HYV package of inputs. It is access to the latter which provides the incentive underlying cooperative discipline. And yet these inputs have been introduced through a number of earlier programmes—e.g., the ARPP and TIP—and continue to be distributed by a variety of different agencies. Moreover, pumps and HYV were initiated in order to accelerate production, regardless of its institutional consequences. Conflicts thus emerge between the IRDP and the other agencies not only over who should control the distribution of the inputs, but also the conditions under which they should be made available to the farmers.

The process through which pump groups and fertilizers are distributed illustrates the diverse interests and rivalries among the thana level authorities. Pump groups formed at the village level are in theory to submit their TIP scheme to the Union Agricultural Assistant, who passes it on to the Secretary of the Thana Agricultural Development Committee (TADC). The Chairman of the TADC is the local MP while its secretary is an employee of the Ministry of Agriculture, the Thana Agriculture Officer. All the TIP schemes for the thana are forwarded to the district level authority, the District Approving Authority (DAA) which takes a decision on the distribution of the power pumps among the different thanas. The DAA consists of the Deputy Commissioner (Chairman), M.P.s and the Project Director of the IRDP. After the scheme is approved by this authority it goes back to the TADC who then requests the BADC to supply the number of pumps as well as the corresponding amount of POL and spare parts. Furthermore, the BADC is responsible for the maintenance of the pumps as well as their storage during the off-seasons.

The relation between the formation of the pump groups and IRDP cooperatives is loose. The TIP certainly operates in non-IRDP thanas; and even in the IRDP thanas pump groups may be formed before an IRDP cooperative exists. As mentioned above, pump groups may be financed by the Cooperative Bank,(Jatiyo Samabay Bank) at a lower rate of interest than the IRDP cooperatives, while the extension of credit is not linked to the necessary disciplines of internal savings. One often hears complaints that the BADC staff at the thana level allocate pumps without prior observances of the necessary formalities. The BADC staff reply that they come under pressure from political workers and sometimes senior government officers to expand the pump groups as quickly as possible as well as bias their distribution in favour of certain groups. The local BADC staff are also under heavy pressure from within their own organisation to field a target number of pumps within a given period.

The TIP pump groups often form the core around which the IRDP cooperatives are later built. However, the purpose, the tempo and the authority controlling the diffusion of this critical input follow considerably different imperatives from those guiding the IRDP : the initial introduction of irrigation facilities follows the most expedient programme to increase production and often becomes confused with political forces in the locality; in the process the IRDP's principle of cooperative discipline is weakened.

A similar situtaion occurs with the distribution of fertilizers. The IRDP links credit with the preparation of production plans at the level of the KSS which specify the amount of fertilizer need by the village. The fertilizer plan is submitted to the TAO through the P O and the ultimate decision on the amount of

fertilizer to be allocated to the KSS comes from the TADC. The TADC applies for the required amount of fertilizer from the BADC who then forwards the approved amounts directly to the Thana godowns. It is then the TADC's responsibility to select the dealers at the local level who will distribute this fertilizer to the farmers. These dealers are ultimately appointed by the BADC. In this whole process once again we see that the theoretical link forged between the allocation of credit and inputs is served by vertical divisions in the system of administration and distribution; as with the pumps, disribution of credit and fertilizers may follow entirely conflicting principles and serve cross-cutting interests. To complicate the picture, insecticides are distributed by the Agricultural department which has no connection with the TCCA or with the TADC.

Although the distribution of inputs provides the real substance to cooperation, the IRDP's Project Officer has little power to influence the TADC. He functions as little more than a liaison officer between the TCCA and the TADC and other agencies of supply. A rigorous coordination of thana level officers is called for on the issue of input supply. Furthermore, the principle of whether or not inputs are to be distributed in the interests of cooperative discipline according to membership, training, and internal savings, or in the interests of the most expedient increase of production must be clarified and settled. At the moment there is a patent rivalry between the Project Officer of the IRDP and the Circle Officer (Development)—who under the RWP coordinated local level development—over direction and control of the thana level officers. Coordination of input supply is directly related to establishing precedence between these two officers.

Thus far we have been dealing with the vertical cleavages within the various development agencies, and the resulting dyarchy which undermines the strength of the IRDP at the thana level. The IRDP also faces a numbr of problems resulting from the horizontal divisions both between government and local society as well as that within rural society itself, between the surplus classes and the traditionally weaker sectors of society. The IRDP hopes to balance its relation with the local community so as to stimulate indigenous leadership and initiative through local representation. On the other hand, the IRDP has clearly recognized that it is meaningless to talk about rural development without considering both the issues of distribution and which classes of rural society are benefitting from the socio-economic changes it is fostering.

Here again conflicts are latent. To encourage local initiative the TCCA Managing Committee elected by the constituent KSS's have been granted considerable powers in the overall structure of the TCCA. The Managing Committee

of the TCCA has authority over the distribution of funds and loans to the member societies. Moreover, the Inspectors and Accountants who are responsible for supervising both the use of credit and general activities of the member societies are the employees of the TCCA and not the IRDP. This certainly ensures a degree of administrative decentralisation, but at the cost of foregoing the amount of control the IRDP can exercise over the social composition of the membership of the cooperatives. The composition of the Managing Committee at the Thana level will reflect that prevailing among its member societies. The unrestricted membership of the KSS opens it to the surplus farmers and traditionally dominant strata of rural society. Moreover, the rapid expansion of the TIP groups and other development agencies often attracts these elements. The fact that the TCCA Managing Committee also hires the inspectors and accountants creates a closed circuit making it difficult for the Project Officer to investigate and supervise the development of the local bodies. This not only sets at odds with one another the IRDP's twin objectives of fostering local initiative and organising the marginal farmers, but widens the space within the system where corruption can take root. Collaboration between the members of the Managing Committee and the Inspectors could easily produce inflated lists of membership or indeed entirely bogus societies entitled to scarce inputs. There is a whole range of interests both among the authorities who grant and the agencies who distribute the inputs who would profit from diverting them away from those small and marginal farmers whom the IRDP specifically hopes to benefit.

There appears then to be two contradictions inscribed in the structure of the IRDP and in its relation to the other development programmes which proceed from it. The IRDP is a "hard programme" linking modern inputs to a rigorous set of organisational principles; the inputs, however, remain in the hands of agencies other than the IRDP whose motive has been to expand their coverage of rural society as rapidly as possible with the help of soft credit and in the interests of rapid production. The current wisdom concerning soft programmes undermining hard ones is not inappropriate to a review of the IRDP's present circumstances. Secondly, the IRDP attempts to combine the principle of administrative decentralisation and unrestricted entry to the cooperative with the improvement of income distribution through the organisation of small and marginal farmers. According to the former set of principles the elected Managing Committee has been given considerable powers in relation to the IRDP's employee, the Project Officer. However, the unrestricted entry to cooperatives offering a more productive technique at subsidized rates is bound to attract large farmers who will eventually dominate the TCCA's Managing Committee. The autonomy of powerful Managing Committee vis-a-vis the Project Officer will erode the IRDP's

position in overseeing the composition of member KSS's. The IRDP can strengthen itself vis-a-vis the other development agencies as well as achieve a degree of consistency in its programmes by linking a monopoly on input supply under its own direction with the principle of restricted membership to the cooperatives ensuring advantages to the small farmer in gaining access to the vital inputs.

X. CONCLUSIONS

In this concluding section we focus more clearly on the considerations discussed above and draw some conclusions concerning the IRDP's role in the development of rural Bangladesh. In the opening sections we attempted a broad outline of the historical trends underlying the present agrarian conditions of Bangladesh and the particular set of dilemmas with which the modernization of agriculture confronts planners and government today. These may be summarized briefly :

(1) The bulk of the population depends directly on agriculture for their livelihood, and are likely to continue to do so for quite sometime even if spectacular industrial growth could be sparked off somehow. If things go on as they are, with population growing faster than domestic food production or the means to import food, the Malthusian alternatives might be posed for the country in the grimmest terms.

(2) Development of industry itself requires that agriculture provide a "surplus" mainly in the form of food and raw materials, and also, at some stage, labour. It is possible that industrialization in certain countries has not been impelled purely by economic logic. Here, we simply accept the fact that the urge to industrialize is present, and imposes certain demands on agriculture.

(3) When a government is committed to planning, no matter what the motivation, agricultural output and sales must be at least predictable and at best controllable. This is not possible when agriculture is carried on by millions of peasant households for whom marketing is a residual consideration, and when the production process in agriculture is heavily dependent on nature. Clearly this involves two kinds of changes, one technical and one social : (a) eliminate dependence on the weather by technical means—irrigation, drainage, flood control etc., and (b) either turn the peasant households into good profit-maximizers so that their production and marketing behaviour can be controlled through price-setting, or organize them into collectives whose decisions can be controlled administratively.

(4) We have so far been talking about an undifferentiated "peasantry". New dimensions to the problem emerge as soon as we recognize that in fact village society is stratified into classes. In formulating its agrarian policy the government now has to recognize that a certain strategy may affect different classes differently, making the tasks of prediction and control even more complex. Disinterested research has to take account of the fact that the different rural classes do not stand in the same relation to the government. The interests of various social classes (as perceived by themselves) may conflict among themselves and with the aims of government policy. Moreover, government policies may affect not simply the levels of living, absolute and relative, of these different classes, but also their power vis-a-vis one another. Finally, a certain policy may fundamentally change the class relations, producing new classes and new production relations. The options open to a government, and not infrequently the fates of government, depend to a large extent precisely on these developments.

A schematized sequence of tasks for a government confronted with an economy dominated by a backward agrarian sector would then be the following :

(a) Try to exert control over the existing rural sector, through prices, administrative policies, or a combination of both.

(b) If the existing structure of rural society does not lend itself readily to control, then try to change it in directions which would facilitate this.

(c) Once (a) or (b) is accomplished, use the control so gained to increase production in general, and the part of production (both food and raw materials) available to urban consumers and to the government in particular.

As we see it IRDP hopes to accomplish tasks (b) and (c) above, that is, increase the level of agricultural output by effecting fundamental changes in rural social and production relations.[17] One sentence from an IRDP document gives us a fairly conscise statement of their view of the cooperatives' role in development : "The cooperatives have been envisaged as a vehicle for economic development enabling the farmers to rally together for protecting themselves from domination by landlords, money-lenders of a semi-feudal society to develop a new leadership for challenging the traditional vested interests". This theme recurs continuously throughout IRDP literature. Moreover, the increased

[17] This is admittedly a question of definition—of deciding what kind of changes are to be treated as "fundamental". It may in fact be more appropriate to define the task of the IRDP as one of accomplishing (c) while keeping changes to a minimum.

labour demand of intensive agriculture gives the landless agricultural labourers a stake in the programme as well. "Although the programme will not directly help improve the lot of the landless labourer or farmers these groups will benefit indirectly from the increased demand for agricultural labour and increased welfare around them" [25]. Thus another partner is drawn into the IRDP alliance, for although unorganised, the increased employment of the wage labouring classes will draw them to the side of the progressive small farmers and the cooperatives.

The IRDP therefore, proposes a fairly complete assault on the agrarian problem of Bangladesh, one which will not only raise the total output and therefore marketable surplus of agriculture, but also distribute rural incomes at higher absolute levels, and in the process tilt the balance of rural power decisively in the interests of the now dependent and depressed sectors of the farming community. The IRDP's overall objectives are indeed commendable, for nothing less would meet the magnitude and complexity of the problems posed by Bangladesh's agricultural development. It is another question, however, whether the concrete programme of combining Comilla-type cooperative with the new productive technology is adequate to these overall goals; or indeed whether the very success of the programme may undermine and perhaps even defeat the very objectives they are intended to promote. The crux of the matter is whether the Comilla-type cooperatives are the appropriate institution for combining growth and equality during the transition to the more intensive cultivation of HYV technology.

Four considerations are relevant to this question : (1) the access of different income groups to the cooperatives; (2) the access to supplies of inputs of different income-groups within the cooperatives; (3) the resulting increment in income of the different income groups; and (4) the disposal of this increment by the different groups.

On the first question, available evidence is thin, but it all points in one direction. There seems to be very little doubt that at present, while the really large landowners may be keeping aloof from the cooperatives, the upper land holding classes are still over-represented. Data on the working of the cooperatives in Natore and Gaibanda bear this out [2, pp. 95-113]. Some other evidence, not as systematic but still suggestive, is offered below.

In Comilla Kotwali Thana, where the basic ingredients of the IRDP programme have had the longest and perhaps the most favourable trial run, there also seems to be a trend towards decreasing access for the really small people. In 1967, the picture was as follows [26]:

TABLE X

DISTRIBUTION OF LAND IN TWENTY EIGHT SAMPLE VILLAGES, 1967

Size Class	Members	Non-Members
No. Cultivable Land	14.35	15
0.80 Acres or Less	22.95	26
0.80 upto 2.00	28.24	28
2.00 upto 4.00	25.10	18
4.00 upto 6.00	6.30	8
6.00 or More	2.56	5

We see that even the landless—presumably sharecroppers—had access in proportion to their numerical strength.

However, a survey of five villages in 1974 show some significant changes. (The sample size is obviously too small to draw any really firm conclusions.)[18]

TABLE XI

DISTRIBUTION OF LAND IN FIVE SAMPLE VILLAGES, 1974

Size Class	Percentage of Families	
	Total	Coop. Members
No. Land	17.02	9.89
Upto 0.5	25.00	18.38
0.5-1.0	17.38	21.55
1.0-2.0	24.55	31.80
2.0-4.0	12.19	15.55
4.0-6.0	2.69	1.77
6.0-10.0	0.90	0.71
10.0-15.0	0.18	0.35

The participation rate of the landless has declined significantly. The other interesting fact is the high participation rate in the 10-15 acre group. This intrusion of the relatively affluent strata into the cooperatives is a fairly well-established fact.

The same kind of pattern emerges in the relatively new IRDP areas. The Table overleaf presents relevant data for four villages from different thanas in all

[18]Data provided by Mr. Mahbub Alam Chashi, from an ongoing project at BARD. This has since been published, but using different class-intervals. See [46, Table 4, p.4]

of which the IRDP established TCCA's in late 1972 to early 1973.[19] Again we see negligible participation by the landless, lower than average participation by people having less than one acre, and over representation for all higher groups. A similar pattern emerges in the study of pump groups.[20] From what we have gathered here we can offer at least a tentative answer to our first question: while the cooperatives present no barrier to the membership of the small and marginal farmers, substantial cultivators soon become over-represented and tend to dominate the organization. Although the data are scattered and inadequate for any thorough generalization we have found little to contradict the impression of rich peasant dominance.

On the second point, whether access to inputs within cooperatives is likely to be discriminatory, we have at this point no data. Our impression is that in fact the relatively larger farmers are likely to gain more. Location of pumps and tubewells are likely to be decided on the basis of promimity to the land of the better of members.[21] (This can and should be tested empirically.) However, here factional consideration might play a moderating role, by making it expedient for the larger farmer to assure water supply to his poorer followers. Similar considerations apply to allocation of fertilizer, insecticides etc.[22] Besides, even if the inputs available to the village society were distributed fairly (in the sense of proportionately to land owned, or land proposed to be sown with HYV) the larger cooperative farmers would find it easier to use the black market as an auxiliary source of supply. They are also more likely to get credit, because they are more credit-worthy, and because they are more likely to be part of or close to the managing committee.

Our third question concerns the resulting increment of income by the different size groups. Here we can only rely on the projection of models formulated around such questions. According to estimates made by a group at the Harvard Centre for Population Studies, intensive agriculture would cause farm incomes to more than triple for almost all farm sizes. The increase is highest for the 1 to 2 acre group (3.8 times), lowest for the 1 acre or less group (2.7 times), and between 3.3 and 3.5 times for all other groups.[23] For our purposes these estimates

[19]Data from IRDP Benchamark survey. We are grateful to Dr. S.A. Qadir, Mr. Mokammel Haque, and Mr. Dawoodur Rahman for permission to use the data and assistance in using it.

[20]See discussion above, Section VIII.

[21]The data on pumps and tubewells discussed Section VIII tend to support this hypothesis.

[22]On our field trips, we found complaints about the high prices of insecticides on all sides, but only the poorer farmers presented us with rice plants eaten away by stem borers.

[23]For details see *Bangladesh Land, Water and Power Study, Draft Final Report*, Harvard University, Center for Population Studies, June 1972 Ch. VI.

TABLE XII

LAND OWNERSHIP IN FOUR VILLAGE, 1973

Size Class (in acres)	Members				Members			
	No.	%	Area Owned	%	No.	%	Area Owned	%
0	2	5.41	0	0	261	43.43	0	0
Upto 1 Acre	6	16.22	355	2.99	146	24.29	4294	9.02
1 & Below 2.5	10	27.03	1167	9.34	112	18.64	14381	30.21
2.5 & Below	8	21.62	1860	15.69	56	9.32	11827	24.84
5 & Below 7	5	13.51	1673	14.11	13	2.16	5855	12.30
7 & Above	6	16.22	6801.5	57.37	13	2.16	11250	23.63
	37	100 (Ap.)	11856.5	100	601	100	47607	100

have two drawbacks: they assume equal access to inputs for all size groups, and they are based on the tenure relations for village Dhanishwar as reported in Dr. Qadir's study [40]. This village as the report points out (page VI. 15), had a very small amount of share-cropping. Since it is usually the middle group, say 2-5 acres, who are net leasers in of land, the above estimates probably overstate their income gain and understate that of the lowest and highest groups.

What is the net impact of these factors likely to be on the distribution of income? Within the cooperatives, it would seem that the distribution would not be significantly affected. Taking the cooperators and the non-cooperators together, in so far as a higher percentage is taken into the cooperatives from higher land-holding groups—which as we saw, is true at least up to around ten acres—the result would clearly be to worsen the distribution of income. With respect to those really larger landowners who stay out of the cooperatives this might be an improvement. But landholders over ten acres were only around 4 per cent of the rural population in 1967/68.

The IRDP's own target was to have, by 1977/78, 61,057 KSS's (primary village societies) with 4.125 million members [25, pp. 42-43]. This was cut down by the First Five Year Plan to 39,000 village societies and 2.57 million members [19, p. 161]. Assume a population of 80 million by 1977/78, of which 75 million are rural. A family size of six would mean 12-13 million households. If each cooperative member represents one household, this means 20 per cent coverage. Assume that 30 per cent of these are landless, and not directly involved in the cooperatives. (As mentioned in Section III, 30 per cent is probably a conservative estimate.) That leaves 8 million households. If each cooperative member represents one household, then the target of 2.57 million members means roughly one third coverage. So one third of the landed rural families are

going to be made three times as well off through cooperatives, and this one third will be picked with a systemstic bias towards the higher landholding groups, at least upto a holding size of ten acres or so. The inegalitarian bias inherent in this is not likely to be significantly mitigated by the exclusion or three or four per cent of the population at the top.

However, the transformations involved go far beyond any shifts in the lorenz curve. Consider the possible ways in which this two hundred per cent increase in income is likely to be utilized. The smaller people will probably consume much of the increment. However, except for the really marginal, this will not be simply consuming the extra product. They will set up a demand for industrial goods, for education for their children and also for some local construction activity—they might want nicer houses. This new enlarged market should certainly help industrial development.

The larger ones are likely to have some investible funds left over. They will of course have higher aspirations for their children and spend more on their education. Then they may, if opportunities exist, invest in trade and business. By offering high enough returns the government might be able to siphon some of these savings for its industrial expansion policy.

But almost certainly they are also going to buy land. Whom will they buy from? Probably not from the smaller cooperative members. The Harvard Population Center Study cited earlier has pointed out that in fact the shadow price of land would be higher for the smaller farmers, so that, if economic considerations were all that mattered, any possible land transaction between cooperators would be between small purchaser and large seller—[*ibid*, p. VI. 20]. So, they will buy from non-cooperators—some perhaps from large landowners, but mostly, one fears, from the small non-cooperative farmer, to whom wage labour may have become more remunerative than holding on to his bit of land. Certainly the shadow price of land would be much higher to the cooperator big farmer, who could therefore offer a very handsome price. Thus, as the Harvard group says, "...a process of land agglomeration similar to that now being witnessed in the Punjab (India) appears to be the most likely outcome: the dynamic implications of this are clear". [*ibid*, p. VI. 18].

Another twist to the situation may be introduced if one considers the possible reactions of the "feudal" elements—the people having say, 25 acres or more. Will they just sit back and watch their position in rural society being eroded? This competition from the bottom might be just what is needed to shake them out of their complacence. They will probably also start going to for intensive

agriculture—either through the cooperatives, or even privately. They may for example take the lead in organizing their sharecroppers into cooperatives.

Such polarizing tendencies are inherent in a situation where a more productive technique is introduced into a society where the initial distribution of basic assets is unequal. The Comilla-type cooperatives fail to take notice of their fact. The cooperatives are open to all farmers interested in increasing their production, and they are designed to benefit their members in proportion to the individual assets of each. Thus rather than counter-balance the polarizing tendencies inherent in the uneven spread and differential transition to a more productive technique, the IRDP cooperatives assist the process to the extent they remain channels of input distribution disregarding the disparate economic positions of its various recipients.

It is not surprising that the Comilla cooperatives fail to offset the social and economic imbalances of HYV cultivation, for the Comilla experiment far predates both the introduction of HYV and any awareness of its accompanying social problems. The Comilla programme—organization, credit, internal savings and discipline—was designed to reinforce the weakest link in the small holder's farm economy and thus strengthen him against the former creditors, traders and substantial neighbours. Although fundamentally a conservative programme which contemplated no basic changes in the distribution of assets or land, the Comilla experiment nonetheless deserved some of the acclaim it received for redressing the economic and social inequities of traditional agriculture.

The advent of HYV and small scale irrigation however, transformed the situation by introducting a higher level of productivity and dynamic economic forces which the Comilla type cooperatives were neither designed nor equipped to meet. The promise of a rapid increase in rice production gave a dramatic impetus to the growth and spread of cooperatives. However, it was because the command area of pumps required the cooperation of a number of farmers, rather than the need to establish self-reliant and disciplined organizations of mrginal farmers that provided the force behind the growth of cooperatives. As a result, the cooperatives which formed around the pumps were rather loose affairs which functioned principally as channels for input distribution. As mentioned earlier the urge to rapid expansion of production and the Comilla principles of organizational discipline are contradictory for two reasons : first, organizing the small peasantry is a time-consuming process; and second, the surplus peasantry are themselves in a position to benefit from the new resources. As soon as the value of the cooperatives becomes apparent to the rich peasants they have a strong incentive to join, lead, strengthen and profit from them. And when the larger farmers

do decide to join the cooperatives there is nothing to prevent them from doing so. Indeed, there is nothing about the structure of the Comilla cooperatives which attempts to mobilise the numbers of the economically weak against the superior assets of the surplus peasants. Thus cooperatives designed to provide credit to marginal farmers under the conditions of traditional cultivation will not necessarily ensure social equality or improved income distribution in the transition to a more productive agriculture. The new technology intensifies the initial inequality of land distribution and introduces a dynamic tendency towards further land agglomeration. Thus the credit cooperatives of marginal farmers under traditional agriculture tend to become the organizations of surplus farmers when combined with the HYV package of modern inputs.

This does not mean that the IRDP programme is irrelevant to the transformation of Bangladesh's agriculture, but that it's two main goals-increased production and greater equality—remain mutually inconsistent in the context of the existing distribution of land: to the extent the first is fulfilled the second is subverted. Despite their stress on organizing the small farmers, the cooperatives offer no substitute for a thorough land reform to improve the distribution of rural incomes.

The IRDP does however, provide a strong organizational basis to promote the increased growth of agricultural production with all the dynamism inherent in modern agricultural technology. It promises to place agriculture on a sound technological basis and provide the necessary training, extension and credit to induce greater numbers of farmers to adopt the new techniques. As constituted, the IRDP is able to accomplish only half its programme—raising agricultural productivity and stimulating growth—but if it succeeds here it will have made an enormous contribution to Bangladesh development. The cooperatives are thus destined, not to usher in "socialism" or a "third way", but essentially to serve as vehicles for the growth of capitalism in agriculture—"cooperative capitalism", to be sure, which, as Lenin put it, "....is a variety of state capitalism and as such is advantageous and useful for us at the present time...."[33, p. 349].

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Appendix

TABLE A-1

DISTRIBUTION OF FARMS BY SIZE AND TENURE, 1967/68

Size Class (acres)	Owner Farms	Owner-cum-Tenant	Tenant			All Farms		
	No. of Farms	No. of Farms	No. of Farms	Farms Area	Average Farm Size	No. of Farms	Farm Area	Average Farm Size
0.01-0.49	763.26	32.98	46.03	15.09	0.33	842.26	164	0.20
	(16.71)	(11.60)	(18.82)	(2.10)		(12.26)	(0.84)	
0.50-0.99	719.98	116.79	35.72	28.03	0.78	872.49	537	0.62
	(15.76)	(5.67)	(14.61)	(3.90)		(12.70)	(2.77)	
1.00-2.49	1,434.46	673.26	68.01	112.13	1.65	2,175.75	5,269	1.50
	(31.41)	(32.71)	(27.81)	(15.62)		(31.67)	(16.86)	
2.50-4.99	987.22	767.38	53.59	191.91	3.58	1,808.18	5,866	3.24
	(21.62)	(37.28)	(21.91)	(26.73)		(26.32)	(30.26)	
5.00- 7.49	363.81	256.24	22.67	125.06	5.52	632.73	3,489	5.51
	(7.75)	(12.45)	(9.27)	(17.42)		(9.21)	(18.00)	
7.50-12.49	208.84	139.46	11.68	112.13	9.60	359.98	3,021	8.39
	(4.57)	(6.78)	(4.77)	(15.62)		(5.24)	(15.58)	
12.50-24.99	86.56	56.33	5.50	92.72	16.86	148.39	2,128	14.34
	(1.89)	(2.74)	(2.25)	(12.91)		(2.16)	(10.98)	
25.00-39.99	10.31	13.05	1.37	40.97	29.91	24.73	672	27.17
	(0.23)	(0.63)	(0.56)	(5.71)		(0.36)	(3.47)	
40.00 and	2.75	2.75				5.50	240	43.64
Above	(0.06)	(0.13)				(0.08)	(1.24)	
Total	7,567.69	2,058.24	244.57	718.05	2.94	6,870.00	19,386	2.82

Figures in brackets are percentages of column totals.

Source : Master Survey of Agriculture in Bangladesh, (Seventh Round, Second Phase), Tables 2(a), 3.

TABLE A-2

PERCENTAGE OF LANDLESS RURAL HOUSEHOLDS, 1961 AND 1973/74

Districts	Percentage Landless, 1961	No. of Households Sampled	No. of Landless Households	Percentage Landless 1973/74
Dinajpur	16.60			n.a.
Rangpur	14.89	460	135	29.35
Bogra	15.64	345	103	29.86
Rajshahi	22.39	453	194	42.83
Pabna	21.23	278	112	40.29
Kushtia	20.07			n.a.
Jessore	12.88			n.a.
Khulna	18.98			n.a.
Barisal	31.44	346	188	54.34
Patuakhali	31.53	597	187	31.32
Mymensingh	16.09	1,444	649	44.94
Tangail	14.56			n.a.
Dacca	17.16	500	82	16.40
Faridpur	24.61	169	85	50.30
Sylhet	12.71	1,135	421	37.09
Comilla	9.80	1,276	355	27.82
Noakhali	16.18			n.a.
Chittagong	18.91	707	388	54.88
Chittagong H.T.	17.56			n.a.
Bangladesh	17.22	7,710	2,899	37.60(37.88)[1]

[1]The percentage within brackets was obtained by weighing the district percentages with 1961 district rural population figures.

Sources : For 1961, 1961 Census of Pakistan, Vol. 2, Table 51, for 1973/74 : IRDP Behchmark Survey (unpublished data).

TABLE A-3

A COMPARISON OF COOPERATIVE MEMBER FARMERS OF COMILLA THANA WITH NON-MEMBER FARMERS OF CHANDINA THANA

Thana	Rice Production			*Value of Production			Value of Produces Sold			Quantity of Rice Sold		
	Average Annual Production (maunds/acres)			Value of Annual Production Per Family			Value of Produce Sold Per Family			Av. Annual Quantity of Rice Sold Per Family		
	1 63/64	969/70	Annual Rate of Increase in %	1963/64	1969/70	Annual Rate of Increase in %	1963/64	1969/70	Annual R I in %	1963/64	1969/70	Annual Rate of Increase in %
Comilla	24.1	47.6	16	Tk.884	Tk.2,736	35	Tk.399	Tk.1,106	30	9.6 md.	35.0 md.	44
Chandina	29.8	33.4	2	Tk.1,063	Tk.2,161	17	Tk.377	Tk. 730	16	11.4 md.	16.1 md.	7

(*Contd.*)

TABLE A-3 (*Contd.*)

Thana	Family Income			*Value of Owned Assets			Value of Liquid Assets		
	Per Capita Income in a Family			Average Value of Owned Assets			Average Value of Liquid Assets Per family		
	1963/64	1969/70	Annual Rate of Increase in %	1963/64	1969/70	Annual Rate of Increase in %	1963/64	1969/70	Annual Rate of Increase in %
Comilla	Tk.243	Tk.565	22	Tk.13,403	Tk.27,194	16	Tk.281	Tk.1,412	67
Chandina	Tk.194	Tk.351	14	Tk.12,144	Tk.19,945	10	Tk.210	Tk.383	13

*Value at Current Price.

TABLE A-4

MONTHLY VARIATION IN RURAL DAILY MONEY WAGE RATES, FIVE DISTRICTS, 1967

Months \ Districts	Dacca	Mymensingh	Faridpur	Comilla	Rajshahi
January	3.00	2.75	2.50	3.00	3.00
February	2.75	2.50	2.50	2.50	3.00
March	2.85	2.75	2.50	3.62	3.00
April	3.00	3.25	2.25	3.38	3.00
May	3.00	2.75	2.50	2.75	2.75
June	2.75	2.25	2.50	2.50	2.75
July	3.00	2.75	2.25	2.75	2.50
August	2.75	2.50	2.00	2.50	2.75
September	3.00	2.75	2.25	2.25	2.75
October	3.00	2.75	2.25	2.25	2.75
November	3.00	2.25	2.50	2.12	2.75
December	2.50	3.00	2.50	2.92	2.62

TABLE A-5

MONTHLY VARIATION IN RURAL DAILY MONEY WAGE RATES, FIVE DISTRICTS, 1971

Months \ Districts	Dacca	Mymensingh	Faridpur	Comilla	Rajshahi
January	3.65	3.75	2.44	3.25	2.50
February	3.55	3.00	2.67	3.75	2.75
March	3.55	3.00	2.25	3.00	3.00
April	3.62	2.58	2.33	3.50	4.00
May	4.16	2.75	2.50	3.25	3.16
June	3.75	2.12	2.50	3.37	3.33
July	4.00	2.75	2.87	3.19	3.00
August	3.42	3.08	3.13	3.19	3.13
September	3.75	2.12	3.12	3.08	3.12
October	3.31	2.87	3.12	3.31	3.50
November	2.81	2.50	3.17	2.50	3.50
December	3.31	3.00	3.25	2.94	3.50

TABLE A-6

MEMBERSHIP STRUCTURE AND CAPACITY UTILIZATION OF DEEP TUBEWELLS & PUMPS, RAJSHAHI

Size Classes by Area Owned (acres)	DTW_1				DTW_2			
	No. of Members	Area Owned	Area Irrigated	$\frac{A.I.}{A.O.} \times 100$	No. of Members	Area Owned	Area Irrigated	$\frac{A.I.}{A.O.}$ %
0.00-0.99					7	3.06	2.57	84.0
					(18.4)	(2.1)	(9.36)	
					8	8.99	2.03	
1.00-1.99					(21.5)	(6.0)	(7.39)	22.6
2.00-2.99	4	8.00	2.33	29.1	9	18.00	2.67	14.8
	(15)	(4.38)	(9.8)		(23.7)	(12.1)	(9.72)	
3.00-3.99	5	15.49	3.03	19.6	2	6.00	2.82	47.0
	(19)	(8.49)	(12.74)		(5.3)	(4.0)	(10.27)	
4.00-4.99	1	4.00	0.66	16.5	1	4.00	0.15	3.8
	(4)	(2.19)	(2.8)		(2.6)	(2.7)	(0.55)	
5.00-5.99	5	25.00	3.81	15.2	3	15.00	1.15	7.7
	(19)	(13.70)	(16.0)		(7.9)	(10.1)	(4.19)	
6.00-6.99	1	6.00	0.66	11.00				
	(4)	(3.29)	(2.8)					
7.00 and Over	10	124.00	13.29	10.72	8	94.00	16.07	17.1
	(38)	(67.95)	(55.9)		(21.5)	(63.1)	(58.52)	
Total	26	182.49	23.78	13.03	38	149.05	27.46	18.42
Planned Irrigated Area		100.00				100.00		
Actual Irrigated Area		33.00				50.00		
Percentage, $\frac{\text{Actual}}{\text{Planned}}$		33.00				50.00		

TABLE A-6 (*Contd.*)

Size Classes by Area Owned (acres)	DTW_3				DTW_4			
	No. of Members	Area Owned	Area Irrigated	A. I./A.O. %	No. of Members	Area Owned	Area Irrigated	A. I./A.O. %
0.00 - 0.99	1	0.16	0.16	100	4	2.25	1.27	56.4
	(2.1)		(0.33)		(7.1)	(0.8)	(2.41)	
1.00 - 1.99	3	3.00	1.66	55.3	12	12.40	4.96	40.0
	(6.3)	(0.91)	(3.45)		(21.4)	(4.22)	(9.43)	
2.00 - 2.99	14	28.00	4.61	16.5	11	22.00	9.21	41.9
	(29.2)	(8.49)	(9.59)		(19.6)	(7.49)	(17.51)	
3.00 - 3.99	4	12.49	3.49	27.9	4	12.00	2.02	16.8
	(8.3)	(3.79)	(7.26)		(7.1)	(4.09)	(3.84)	
4.00 - 4.99	3	12.00	2.32	19.3	3	12.00	1.45	12.1
	(6.3)	(3.64)	(4.82)		(5.4)	(4.09)	(2.76)	
5.00 - 5.99	1	5.00	0.50	10.0	6	30.00	3.98	13.3
	(2.1)	(1.52)	(1.04)		(10.7)	(10.22)	(7.57)	
6.00 - 6.99	4	24.00	2.22	9.3				
	(8.3)	(7.28)	(4.62)					
7.00 and Above	18	245.00	33.13	13.5	16	203.00	29.72	14.6
	(37.5)	(74.32)	(68.89)		(28.6)	(69.13)	(56.49)	
Total	48	329.65	48.09	14.6	56	293.65	52.61	17.9
Planned Irrigated Area		100				95		
Actual Irrigated Area		50				32		
Percentage, Actual/Planned		50				33.7		

(*Contd.*)

TABLE A-6 (*Contd.*)

Size Classes by Area Owned (acres)	DTW_5			
	No. of Members	Area Owned	Area Irrigated	$\frac{\text{A. I.}}{\text{A.O.}}$ %
0.00 - 0.99	1	0.66		
	(2.9)	(0.4)		
1.00 - 1.99 .	5	5.99	0.51	8.5
	(14.3)	(3.23)	(6.8)	
2.00 - 2.99	6	12.33	0.87	7.1
	(17.1)	(6.64)	(11.6)	
3.00 - 3.99	8	24.00	2.30	9.6
	(22.9)	(12.93)	(30.6)	
4.00 - 4.99	2	8.66	0.66	7.6
	(5.7)	(4.67)	(8.8)	
5.00 - 5.99	6	30.33	1.68	5.5
	(17.1)	(16.34)	(22.4)	
6.00 - 6.99	1	6.66		
	(2.9)	(3.59)		
7.00 and Above	6	96.99	1.49	1.5
	(17.1)	(52.25)	(19.8)	
Total	35	185.62	7.51	4.1
Planned Irrigated Area		100		
Actual Irrigated		12		
Percentage, $\frac{\text{Actual}}{\text{Planned}}$		12		

TABLE A-7
COMPOSITION AND PERFORMANCE OF LOW-LIFT PUMP GROUPS, KUSHTIA

	k_1	k_2	k_3	k_4	k_5	k_6	k_7	k_8	k_9
1. Size and Composition of Group									
a) Total No. of Farmers	70	80	71	85	110	60	50	72	75
b) Farmers Having 10 Acres Or more									
c) Farmers Having 2.5-10 Acres	9	12	4	2		1	2	3	3
d) Farmers Having Less than 2.5 Acres	61	68	65	83	110	59	48	69	72
e) Land Owned & Irrigated									
(i) By Group Manager	27.75acres	4-0	11-0	2-50	33-0	6-0	1-0	5-0	5-35
(ii) Model Farmer	2.42	2.50	2.50	1-0	10-0	1-0	0-66	3-0	2-0
2. Area to be Irrigated as per Scheme	160 acres	140 acres	200 acres	130	100	100		130	
3. Area Actually[1] Irrigated									
(a) Boro	10 ,,	14 ,,	12 ,,	10	14	21	13	40	44
(b) Aman	30 ,,	7 ,,	60 ,,	52	41	30	26	30	32
(c) Robi	100 ,,	101 ,,	117 ,,	20	10	27	25	30	30
(d) Aus				39	25	15	7	5	5
Total	140	122	189	121	90	93	71	105	111

(*Contd.*)

TABLE A-7 (*Contd.*)

	k_{10}	k_{11}	k_{12}	k_{13}	k_{14}	Minimum	Maximum	Average
1. Size and Composition of Group								
(a) Total No. of Farmers	70	60	14	21	62	14 No.	110 No.	64 No.
(b) Farmers Having 10 Acres or More						2 ,,	2 ,,	
(c) Farmers Having 2.5-10 Acres	2		4	2	8	1 ,,	12 ,,	4 ,,
(d) Farmers Having Less than 2.5 Acres	68	60	10	19	54	10 ,,	110 ,,	60 ,,
(e) Land Owned & Irrigated								
(i) By Group Manager	5-35	0-33	5-0	2-0	2-0	0-33 acres	33-0 acres	37-0 acres
(ii) Model Farmer	3-0	1-0	3-0	5-0	2-0	0-66 ,,	10-0 ,,	2-65 ,,
2. Area to be Irrigated as per Scheme	100	120	44	16	100	16 ,,	200 ,,	96 ,,
3. Area Actually Irrigated								
(a) Boro	40	30	18	2	31	2 ,,	44 ,,	21 ,,
(b) Aman	17	25	25	12	20	7 ,,	60 ,,	29 ,,
(c) Robi	25	40	15	30	30	20 ,,	117 ,,	32 ,,
(d) Aus	10	12	13	30		5 ,,	39 ,,	11½ ,,
Total	92	107	71	74	81	71 ,,	189 ,,	105 ,,

[1]To compare with (3) only *boro* acreage should be considered.

TABLE A-8

KUSHTIA DEEP TUBEWELLS

Kushtia District*	Deep Tubewell								
	k_1	k_2	k_3	k_4	k_5	k_6	Minimum	Maximum	Average
1. Size & Composition of Group									
(a) Total No. of Farmers	92	60	61	70	60	65	60	92	68
(b) Farmers Having 10 Acres or More									
(c) Farmers Having 2.5 Acres to 10 Acres		4	15	6	4	24	4	24	8
(d) Farmers having Less than 2.5 Acres	92	56	46	64	56	41	40	92	59
(e) Land Irrigated & Owned by									
(i) Group Manager	0.96	7.0	2.15	3.0	3.0	3.0	0.96	7.0	3.18
(ii) Model Farmer	2.48	1.5	3.0	4.0	4.0	2.0	1.5	4.0	2.83
2. Area to be Irrigated as per Scheme (acres)	80	70	75	75	80	75	70	80	76
3. Area Actually Irrigated (acres)									
(a) Boro	5		7		30	27	5	30	12
(b) Aus	45	42	25	70		50	25	70	39
(c) Aman	65	20	30		8	15	8	65	23
(d) Rabi	65	22	15	50	59	30	15	65	40

*Sample Survey was conducted in five thanas :
1. Daulatpur 2. Chuadanga 3. Dammirhuda
4. Gaugni 5. Meherpur.

TABLE A-9

KUSHTIA SHALLOW TUBEWELLS

Kushtia District*	K_1	K_2	K_3	K_4	K_5	K_6	K_7	K_8	Minimum	Maximum	Average
1. Size & Composition of Group											
(a) Total No. of Farmers	10	7	1	4	10	3	3	3	1 No.	10	5
(b) Farmers Having 10 Acres or More			1								
(c) Farmers Having 2.5 Acres to 10 Acres	1			2	1	1	1	1	1 ,,	2	1
(d) Farmers Having Loss than 2.5 Acres	9	7		2	9	2	2	2	2 ,,	9	4
(e) Area Irrigated in Acres Owned by											
(i) Group Manager	1.0	1.0	4.0	4.0	2.75	1.0	4.0	4.0	1.0(acres)	4.0	2.44
(ii) Model Farmers	0.5	1.0		1.0	1.0	1.0	4.0	4.0	0.5 (,,)	4.0	1.56
2. Area to be Irrigated As Per Scheme	7	5	10	8	9	10	7.5	10	5 (,,)	10	8.2
3. Area Actually Irrigated											
(a) Boro :	4						3		3 (,,)	4	0.9
(b) Aus :			4	6	3	3	1	4	1 (,,)	6	3
(c) Aman :					3	3	6	7	2 (,,)	7	2.25
(d) Rabi :	6	4	4	4	2	3	4	3	2 (,,)	6	3.75
Total	10	4	8	10	8	8	14	14	4	14	9.50

*Sample Survey was conducted in six thanas :

1. Gangni
2. Meherpur
3. Bheramara
4. Daulatpur
5. Alamdanga
6. Jibannagar.

Notes

A Note on the Condition of Rural Poor in Bangladesh

by

SALIMULLAH

AND

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I. INTRODUCTION

The main purpose of this note is to analyse the real condition of the rural poor on the basis of the following characteristics.

a) Level of poverty;
b) Income per capita;
c) Number of dependents per working member; and
d) Ownership of assets.

On the basis of such an analysis it would be possible to identify the measures which can be adopted to improve, in real terms, the living condition of the rural people.

In Section II the nature of data on which the study is based is explained and the variables which are used in the text are defined. In Section III, some characteristics of sample households are presented to see the real position of the rural people. Section IV presents the concluding remarks.

II. METHODOLOGY AND DATA

During the outbreak of famine in the year 1974 in Bangladesh, the Bangladesh Institute of Development Studies conducted a survey to assess the short and long term consequences of the famine. Eight villages from different districts were selected for this purpose of which four were in famine affected areas and the other four were in non-famine areas.

Comprehensive data on different aspects of 1,774 households were collected for the agricultural year 1973/74. All the households were classified according,

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to (i) tenurial status, (ii) major occupation and employment status and (iii) level of poverty.

Total family income is partitioned into the following components ; income from crop production, share/rent, livestock, poultry, forestry and fishery wage labour, carts, boats, trade and business, salaries and others. Income from crop production has been calculated by deducting all paid out expenses from gross value of total output (adjusted for share/rent if any).

To identify the rural households living below the minimum subsistence level, the value of per adult requirement of food items[1] (normally consumed in rural areas) per annum were calculated on the basis of 1973/74 prices, reported by the heads of the families and the Directorate of Marketing, Government of the People's Republic of Bangladesh. The poverty level income was calculated for different areas using respective prices of the items included in the minimum consumption bundle.

The value of the minimum consumption bundle per adult was found to be Tk. 252 in the year 1966 [1], but in 1973/74 it increased to Tk. 923. Since an average person equals 0.80 adult unit, the minimum diet for an average person[2] in rural areas costs Tk. 735 per annum i.e., Tk. 2 per day in 1973/74 prices.

Total assets owned by the household is calculated on the basis of following assumptions:

i) Value of land=(cultivable land+2 x homestead[3] land) x average price of cultivable land.

ii) Average price of land is expressed in 1974/75 prices.

iii) Other assets owned by the rural households include bullocks, cows, ploughs, carts, boats and rickshaws valued at 1974/75 prices.

iv) Total assets=Value of land+value of other assets.

III. FINDINGS

In Table I, data on per capita income of the rural households by poverty level and by tenurial status, occupation and employment are presented. It is

[1]Food items included are the following : Rice (coarse), Wheat, potato, Sugar/*gur*, Pulses (*masoor*), Vegetables, Fish (*chingri*), Meat (beef), milk (cow), Fats and Oil (mustard), Fruits (banana).

[2]Average person is defined as the ratio of total adult unit to total population. In order to calculate adult (male) unit female adult has been taken equivalent to 0.9 adult and children (10 years and below as 0.5 adult).

[3]Homestead land has been evaluated at twice the average price of cultivable land.

found that the per capita income of the people living below poverty level is Tk. 341. It is significantly different from the poverty income, which is Tk. 735 for an average person. It is also found from Table I that among different tenurial groups the condition of the people belonging to labourer class and living below poverty level is very desperate. A similar picture emerges for wage earners, transport owners and others within different catagories. It is interesting to note that the level of living of the people in the class of tenant farmers (Tk. 892 per capita) and wage earners (Tk. 867 per capita) above poverty level is not significantly different from poverty income. The economic condition of the owner farmers and that of the transport owners above poverty line is found to be better than other groups in their respective classes. To raise the average income of the people below poverty line up to poverty level, it will have to be increased by another 115 per cent on an average.

TABLE I

INCOME PER CAPITA BY LEVEL OF POVERTY AND BY TENURIAL STATUS, OCCUPATION AND EMPLOYMENT STATUS

(Tk. in 1973/74 prices)

Household Type	Income Per Capita Above Poverty Level	Income Per Capita Below Poverty Level
1. Tenurial Status		
Owner Farmer	1,389	349
Owner-cum-Tenant Farmer	1,117	365
Tenant Farmer	892	355
Labourer	1,021	283
2. Occupation and Employment Status		
Farmers	1,302	360
Wage Earners	867	285
Trade and Business	1,709	317
Transport Owners	2,160	298
Salary Earners	1,168	398
Others	1,217	206
Total	**1,287**	**341**

In Tables II and III data are presented on the respective distribution of population and income of rural households by the level of poverty and by tenurial status, occupation and employment status. From Tables II and III, we find that the distribution of income is very unequal. On the whole only 20.56 per cent people living above poverty level are enjoying 49.42 per cent of the total income, whereas the rest i.e., 79.44 per cent of the population living below that level are enjoying 50.58 per cent of the total income.

From these tables it is also found that the major portion of the rural people are owner farmers (i.e., 54.88 per cent) earning 63.31 per cent of total income. And among the owner farmers only 25 per cent are earning 55 per cent of their income while the remaining 75 per cent are sharing the rest (45 per cent).

TABLE II

PERCENTAGE DISTRIBUTION OF POPULATION BY LEVEL OF POVERTY AND BY TENURIAL STATUS, OCCUPATION AND EMPLOYMENT STATUS

Household Type	% of Population above Poverty Level	% of Population Below Poverty Level	Total
1. Tenurial Status			
Owner Farmer	13.66	41.22	54.88
	(25)	(75)	(100)
Owner-cum-Tenant Farmer	5.09	19.71	24.80
	(21)	(79)	(100)
Tenant Farmer	0.40	3.72	4.12
	(10)	(90)	(100)
Labourer	1.41	14.79	16.20
	(9)	(91)	(100)
Total	**20.56**	**79.44**	**100.00**
2. Occupation and Employment Status			
Farmers	15.56	47.88	63.44
	(25)	(75)	(100)
Wage Earners	1.26	17.55	18.81
	(7)	(93)	(100)
Trade and Business	1.28	6.37	7.65
	(17)	(83)	(100)
Transport Owners	0.04	0.31	0.35
	(11)	(89)	(100)
Salary Earners	2.26	6.29	8.55
	(26)	(74)	(100)
Others	0.17	1.04	1.21
	(14)	(86)	(100)
Total	**20.56**	**79.44**	**100.00**

Note : Figures within parentheses are relative proportion in percentage wihthin each sub-group.

The labourer class representing 16.20 per cent of the rural population is earning 10.51 per cent of total income. Of these only 9 per cent is living above poverty level and earning 26 per cent of the total group income. The remaining 91 per cent who fall below poverty line is earning 74 per cent of the total group income having to fight with famine for survival.

TABLE III

PERCENTAGE DISTRIBUTION OF INCOME BY LEVEL OF POVERTY BY TENURIAL STATUS, OCCUPATION AND EMPLOYMENT STATUS

Household Type	% of Income Above Poverty Level	% of Income Below Poverty Level	Total
1. Tenurial Status			
Owner Farmer	35.45	28.86	64.31
	(55)	(45)	(100)
Owner-cum-Tenant Farmer	10.63	13.43	24.06
	(44)	(56)	(100)
Tenant Farmer	0.66	2.47	3.13
	(21)	(79)	(100)
Labourer	2.69	7.82	10.51
	(26)	(74)	(100)
Total	**49.42**	**50.58**	**100.00**
2. Occupation and Employment Status			
Farmers	37.86	32.19	70.05
	(54)	(46)	(100)
Wage Earners	2.04	9.36	11.40
	(18)	(82)	(100)
Trade and Business	4.07	3.78	7.85
	(52)	(48)	(100)
Transport Owners	0.14	0.17	0.31
	(45)	(55)	(100)
Salary Earners	4.93	4.68	9.61
	(51)	(49)	(100)
Others	0.38	0.40	0.78
	(49)	(51)	(100)
Total	**49.42**	**50.58**	**100.00**

Note : Figures within parentheses are relative proportion in percentage within each sub-groups.

Owner-cum-tenant farmers and tenant farmers are representing respectively 24.80 per cent and 4.12 per cent of total population and their respective shares in the total income are 24.06 per cent and 3.13 per cent; and the people living above poverty level within each of these two classes representing 21 per cent and 10 per cent respectively enjoy 44 per cent and 21 per cent of total income.

In terms of occupation and employment, Tables II and III indicate that the farmers representing 63.44 per cent of total population is earning 70.05 per cent

of total income. The relative proportions of people within farmer class, above and below poverty level, are 25 per cent and 75 per cent and their relative shares of income are 54 per cent and 46 per cent respectively.

Wage earners representing 18.81 per cent of total population are earning only 11.40 per cent of total income. As compared with other groups, the proportion of people living below poverty level within the wage earner class is high.

Dependency ratios by poverty level of rural households, tenurial status and occupation and employment status are presented in Table IV. Dependency ratio of the people above poverty level (3.19) does not differ significantly from that of the people below poverty level (3.62) (Table IV). However, we consider income per working member (below poverty level Tk. 1,234 and above poverty level Tk. 4,102) the difference in their relative standard of living, is quite obvious.

TABLE IV

DEPENDENCY RATIO BY LEVEL OF POVERTY AND BY TENURIAL STATUS, OCCUPATION AND EMPLOYMENT STATUS

Household Type	Dependency Ratio Above Poverty Level	Dependency Ratio Below Poverty Level
1. Tenurial Status		
Owner Farmer	3.24	4.06
Owner-cum-Tenant Farmer	3.45	3.31
Tenant Farmer	3.21	2.80
Labourer	2.22	3.28
2. Occupation and Employment Status		
Farmers	3.31	3.66
Wage Earners	2.20	3.42
Trade and Business	3.63	3.73
Transport Owners	2.00	4.38
Salary Earners	3.06	3.93
Others	2.38	2.81
Total	**3.19**	**3.62**

It is clear from Table V that the ownership of assets per capita of the people above poverty level is comparatively larger than the people below poverty level except in case of wage earners and transport owners. These exceptions may be due to the following (i) The proportion of people above poverty level (Table II) within each of these classes is negligible. So the result can be viewed questionably.

(ii) The number of dependents per working member within each of these classes above poverty level is smaller in comparison with other classes (Table IV).

TABLE V

TOTAL ASSETS PER CAPITA AND DISTRIBUTION OF TOTAL ASSETS BY LEVEL OF POVERTY AND BY TENURIAL STATUS, OCCUPATION AND EMPLOYMENT STATUS

Household Type	Total Assets Per Capita in Taka		% Distribution of Total Assets		
	Above Poverty Level	Below Poverty Level	Above Poverty Level	Below Poverty Level	Total
1. Tenurial Status					
Owner Farmer	3,638	2,348	24.03	46.79	70.82
Owner-cum-Tenant Farmer	3,181	1,921	7.83	18.30	26.13
Tenant Farmer	814	582	0.16	1.05	1.21
Labourer	320	226	0.22	1.62	1.84
Tota	**3,243**	**1,753**	**32.24**	**67.76**	**100.00**
2. Occupation and Employment Status					
Farmers	3,798	2,353	28.58	54.47	83.05
Wage Earners	572	628	0.35	5.33	5.68
Trade and Business	2,119	985		3.03	4.33
Transport Owners	74	1,433	1.30*	0.21	0.21
Salary Earners	1,792	644	1.96	4.47	6.43
Others	569	496	0.05	0.25	0.30
Total	**3,243**	**1,753**	**32.24**	**67.76**	**100.00**

*Insignificant.

An explanation of inequality of income and level of poverty of different classes can be found in the distribution of total assets. Table V reveals that owner farmers, owner-cum-tenant farmers, tenant farmers and labourers who constitute 54.88 per cent 24.80 per cent, 4.12 per cent and 16.20 per cent respectively of total population (Table II) own 70.82 per cent, 26.13 per cent, 1.21 per cent and 1.84 per cent of total assets.

It is clear from the above analysis that the great bulk of the rural poor consists of farmers and wage earners. Any programme which aims at benefiting the rural poor must focus directly on these classes.

IV. CONCLUDING REMARKS

To take any major decision about the people one must know the condition of the locality, the available resources that can be utilised, and the job opportunities as well as the occupational structure of the people.

Generally, people living in the rural areas face serious economic hardship before harvesting their principal crops. During this period the Government agencies concerned with development works can undertake various development programmes suitable for that locality to provide more employment to rural labourers.

The land development work in the initial phase and the increased absorptive capacity of agriculture when the development potential of land has been improved should provide more employment to rural labourers and a large number of technical personnels. The multiplier effect of this kind of rural development work on the other sectors of the economy could generate more employment all around. In this connection the development potential of *haor* areas can be specifically mentioned.

In low lying fallow areas deep water broadcast *aman* can be cultivated and during *boro* season a sizeable proportion of land can be brought under *boro* crops by mechanised irrigation. This will improve the employment situation.

By forming cooperative societies of various types some part of the surplus farm and non-farm labour may be employed. Cottage industries, poultry raising, fish culture etc. are some suggested areas where cooperatives may be considered to reduce underemployment and disguised unemployment in rural areas.

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Capacity Utilisation in Selected Manufacturing Industries of Bangladesh

by

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I. INTRODUCTION

The study of capacity utilisation is important and at the same time interesting for less developed countries where capital is both scarce and underutilised. The level of capacity utilisation not only determines how much more output can be obtained by fuller utilisation of existing capacity but also defines the required expansion of capacity for a targetted output. Also, employment is directly, and per unit capital service cost is inversely, related to the rate of capacity utilisation. The available evidence suggests that any increase in capacity utilisation will mean reduction in average cost of production.

The main purpose of this study is to find out the degree of capacity utilisation of selected manufacturing industries of Bangladesh. In Section II conceptual issues related to the measurement of capacity utilisation are discussed. Different procedures for the measurement of capacity utilisation are also defined and presented in this section. Data and results are analysed in Section III. The performance of different industries under study are here discussed separately. Also attempt is made to make an inter-industry comparison. Section IV endeavours to identify the basic causes for underutilisation.

II. CONCEPTS AND METHODOLOGY

The capacity concept has played an important role in economic analysis. Unlike many well defined concepts, capacity has been subjected to alternative definitions and misconceptions. The engineer's idea of capacity differs from the economist's definition since what is technically possible may not be economically desirable. The differences in definition among economists are also significant. These differences are attributable (a) to the differences in economic issues under consideration and (b) to the limitations of measurement procedures.

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In this section, we shall spell out in detail the concepts of variables used and the procedure followed in their measurement. Capacity in this context is the maximum outflow which could be achieved from the installed capital stock in a given period. Utilisation means actual amount of capacity which is being employed to get output in the same period. So capacity utilisation is defined to establish a link between the two. Degree of capacity utilisation (C_u) is defined as the ratio between actual utilisation and potential capacity of any plant : $C_u = \frac{A}{C}$ where C_u=degree of capacity utilisation, A=actual annual production and C=annual maximum output.

Capacity utilisation can be written otherwise as :

$$C_u = \frac{A}{T.X_K} \qquad (1)$$

where X_K=hourly output at 100% efficiency.

T=the period of observation.

(8760 hours=365×24)

$T.X_K$ is theoretical maximum output. But practically it is possible neither to work a machine for 24 hours of 365 days nor obtain 100% efficiency level. Instead of T we shall consider t which means maximum feasible hours which can be worked. Now X_K, the hourly output at 100% efficiency level, is an engineering maximum. Capacity utilisation seldom exceeds 90 per cent of engineer's rated capacity. A plausible explanation for this is that the maximum output which a machine can produce per hour from the engineering point of view can not be achieved due to wastage in process, machine break-down, lack of proper labour attention and supervision etc. Due to these practical reasons, operating and maintenance costs rise sharply for higher levels of output. So the maximum efficiency at this level fails to be the 'economic maximum'. 'Economic maximum' is that level which is established taking into account all the relevant economic factors that influence the production environment. The authors have been told by experienced managers that in practice it is possible to obtain 75% of engineering efficiency level in Bangladesh. This is also confirmed by the experiences in other countries like India. Therefore, it is not unreasonable to consider 75% efficiency level as feasible economic maximum [1] for the present study.

We now write:

$$C_F = \frac{A}{t.aX_K} \qquad (2)$$

where,

C_F = Feasible capacity utilisation rate.

A = Actual annual output.

t = Feasible maximum number of hours that can be worked during T.

a = Proportion of X_K considered attainable under prevailing conditions.

X_K = Hourly output at 100% efficiency level.

This measure of capacity utilisation is calculated on the basis of t (feasible maximum number of hours) that can be worked. We are interested to know the extent of utilisation on the basis of actual number of hours worked. That is, to what extent it has utilised the time it has worked. This measure can be written as :

$$C_A = \frac{A}{t' a x_K} \qquad (3)$$

where, t', = actual number of hours worked.

It may happen that actual working hours are not fully utilised. There may be scope of more utilization under existing conditions.

So far we have described different concepts of capacity utilisation used in our study. On the basis of these concepts we shall find out degree of capacity utilisation and underutilisation of different industries. Where there is under utilisation of capacity there is scope of utilising capital more intensively by increasing shift of work i.e., "shift-coefficient" [3, p. 47].

It is expressed as follows :

$$S = \frac{E_1+E_2+E_3}{E_1} = \frac{E}{E_1}$$

where,

S_1 = Shift-coefficient.

E_1 = Number of man hours worked in 1st shift.

E_2 = Number of man hours worked in 2nd shift.

E_3 = Number of man hours worked in 3rd shift.

In 1930 Soviet Planners laid much importance on shift-work. They envisaged that production is not a function of investment alone, it can be the consequence of other ancillary factors also such as an increase in shift of work. With

this consideration they constructed a new theoretical formula.[1] In 1931, of the planned increment in production 42% was accounted for by investment, 38% by increase in number of shifts, 9% by increase in number of days and 11% by increased efficiency [4].

For Jute Industry of Bangladesh, which is composed of a number of looms, degree of capacity utilisation can be calculated in a slightly different way. Here we have incorporated loom in the formula. Looms installed are not always in operation due to various reasons. Operation of idle looms can increase utilisation of capacity. In this case, therefore, we now define capacity utilisation C_1, on the basis of actual days worked, on existing shifts and looms actually operating.

$$C_1 = \frac{A}{L_1.t_1.ax_k}$$

where,

C_1=Capacity utilisation in jute manufacturing.

A=Actual production.

L_1=Total number of looms actually operating.

t_1=Number of hours actually worked.

a and X_K are defined as before. By C_1, we shall find out actual level of efficiency at which the loom has operated.

A different concept of capacity utilisation C_2 is defined on the basis of desirable days (300), desirable shifts (3 shift) and installed looms.

$$C_2 = \frac{A}{L.t.ax_k}$$

L=Total number of installed looms.

t=Maximum feasible number of hours which can be worked (300 x 23.50=7050 hours).

III. DATA AND RESULTS

Data for this study were obtained by the authors directly from different corporations responsible for the management of industries under consideration. Results for different industries are analysed separately below.

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[1] O=oi+os+ow+or where O is the increment of industrial production; oi is the increment due to investment; os is that due to increase of shift-coefficient; ow is that due to increase in the number of working days per year; and or is that due to increment in efficiency.

A. Sugar Industry

There are fifteen sugar mills in Bangladesh. The maximum achievable output depends on the rate of recovery of sugar from the sugar-cane and the maximum number of days worked by a mill. As this industry is a seasonal one, the mill cannot run for more than six months. For our study, we have assumed the same rate of recovery of sugar from sugar-cane for all the different sugar mills in 1973/74. It seems reasonable that a given sugar mill can efficiently work for 24 hours every day for 160 days. Hence, we have taken maximum working hours to be $(24 \times 160) = 3840$ hours for sugar mills. Assuming the rate of recovery of sugar from sugar-cane to be 8.5%, the sugar mill corporation has calculated the installed capacity of sugar of each year. For some of the mills, it is not unlikely that production may exceed the installed capacity as defined above, if the rate of recovery of sugar from sugar-cane exceeds 8.5% and also if the mill can work efficiently more than the assumed days. Of course, this rate depends on the quality of the sugar-cane. The better the quality, the greater is the sucrose content in the sugar-cane. In the weather condition of our country sugar content can achieve a maximum of 10.25% with the present level of technology.

The results of our calculation are shown in Table I. The table indicates the following:

TABLE I

CAPACITY UTILISATION IN SUGAR INDUSTRY

Name of the Enterprise	Actual Shift-Coefficient	Capacity Utilisation (percentages)		
		Existing Shift-Coefficient (1973/74)	Desirable Shift-Coefficient	
			2.94	2.875
North Bengal	2.28	100	77.55	79.30
Setabgonj	1.83	27	16.81	17.19
Deshbandhu	1.73	32	18.83	19.26
National	1.56	22	11.67	11.94
Carew and Co.	2.35	65	51.96	53.13
Rangpur	1.75	37	22.02	22.52
Thakurgaon	2.33	38	30.12	30.80
Zeal Bangla	2.06	50	35.03	35.83
Jaipurhat	1.91	65	42.23	43.18
Kushtia	1.83	61	37.97	38.83
Rajshahi	1.26	61	26.14	26.73
Mobarakgonj	0.89	66	15.49	20.43
Shympur	0.85	55	15.90	16.26
Panchagarh	1.10	12	4.49	4.59
Kaliachapara	0.73	24	5.96	6.09
Average	1.63	47.67	27.48	28.41

Source : Bangladesh Sugar Mills Corporation.

1) No sugar mill worked for 3840 hours and the shift-coefficient varies from .73 to 2.35. The relative rate of utilisation which expresses the actual number of hours worked per day as a percentage of the maximum feasible hours, ranges from 25 to 80. This points out that the enterprises with relatively poor performance should be able to improve their capacity utilisation since other firms, operating under very similar conditions, have performed better.

2) From Table I, we find that on an average the rate of capacity utilisation in sugar industry works out to be 47.67% in 1973/74. The actual rate of capacity utilisation at existing shift basis is found to vary between 12% and 100% in different enterprises. But on desirable shift basis, we can see the same varying from 4.49% to 77.55% and from 4.59 to 79.30 depending on the assumed shift-coefficient. On desirable shift basis the average rate of capacity utilisation varies between 27.48% and 28.41%. It is evident that in the year 1973/74, the performance of sugar industry was very poor.

B. Jute Manufacturing Industry

The main products of a jute mill are (i) Hessian (ii) Sacking and (iii) Carpet Backing. The final product jute cloth is produced on the loom. Each loom uses labour and other variable inputs to produce jute cloth.

This study is based on 1972/73 data for 16 mills. In Hessian average degree of utilisation under existing condition is 71.39% and 61.62% at a=0.65 and a=0.75 respectively (Table II). On the other hand, the same calculated on the basis of installed loom, 3 shifts and 300 days is only 47.87% at 65% efficiency norm and 35.92% at 75% efficiency norm.

Degree of capacity utilisation in 1972/73 (Table II) was quite low compared with that of the year 1968/69[1]. In 1968/69 degree of capacity utilisation under existing conditions at 75% efficiency norm was 71%, while in 1972/73 it was 61.62%. Also on the basis of desirable condition it was 50% at 75% efficiency in 1968/69 and in 1972/73 it was 41.87%. This shortfall is due to disruption caused by the liberation war. Table II also indicates the degree to which production can be increased by increasing shift-coefficient. We find that average actual production of Hessian in 1972/73 was 3260 tons whereas on the basis of 3 shift operation for 300 days with installed looms and assume 75% efficiency norm average output would have been raised to 9379 tons.

For Hessian, we have tried to find out whether there is any relation between the degree of capacity utilisation and per unit cost of production. It can normally be hypothesized that when existing capacity is utilised more efficiently, per unit

TABLE II

PRODUCTION AND CAPACITY UTILISATION (PERCENTAGES) OF JUTE MANUFACTURING INDUSTRIES OF BANGLADESH (HESSIAN) 1972/73

Name of the Jute Mills	Actual Production (tons)	Actual Shift Coefficient	Capacity Utilisation on the Basis of Actual Days Worked, Existing Shift and Loom Actually Operating		Capacity Utilisation on the Basis of Desirable Days (300 days), Desirable Shifts (3 shifts, 23·50 hours) and Installed Looms		Output on the Basis of 300 days 3 Shifts and Installed Looms (tons)
			65% eff. norm	75% eff. norm	65% eff. norm	75% eff. norm	75% eff.norm
Sonali	3951.06	1.88	104.49	90.56	52.99	45.92	8603.98
Janata	2740.92	2.00	91.88	79.62	58.38	50.60	5417.32
Pubali	1532.29	1.84	78.46	68.00	36.99	32.06	4779.99
Fauzi	2431.64	2.63	80.08	69.40	50.31	43.60	5576.66
Jessore	4678.65	2.94	76.68	66.45	56.47	48.94	9559.98
Star	4191.77	2.00	60.14	52.12	27.10	23.49	1,7845.31
Afil	929.81	2.94	48.05	41.64	26.93	23.43	3983.32
Aleem	1071.40	1.59	82.64	71.62	31.04	27.00	3983.32
Eastern	2414.55	2.88	76.82	63.58	67.24	58.00	4142.66
Nowapara	1247.93	1.78	66.09	57.28	31.33	21.26	4779.99
Platinum	5814.04	2.00	65.47	56.74	37.59	32.70	1,7845.31
A.R.Hawlader	1533.67	2.00	57.82	50.11	37.02	32.21	4779.99
Crescent	9565.00	2.94	65.79	56.15	49.48	43.05	2,2306.64
Peoples	5236.34	2.38	64.55	55.94	27.24	23.70	2,2179.17
Quami	2354.60	2.00	67.90	58.84	33.30	27.97	8157.85
Ashraf	2466.35	2.50	55.29	47.91	46.51	40.46	6118.39
Average	3260.00	2.14	71.39	61.62	47.87	35.92	9378.74

Source : Bangladesh Jute Industries Corporation.

TABLE III

PRODUCTION AND CAPACITY UTILISATION (PERCENTAGES) IN JUTE MANUFACTURING INDUSTRY OF BANGLADESH (SACKING), 1972/73

Name of the Jute Mills	Actual Production (tons)	Actual Shift Coeffi-cient	Capacity Utilisation on the Basis of Actual Days Worked, Existing Shift and Looms Actually Operating		Capacity Utilisation on the Basis of Desirable Days (300), Desirable Shift (3 shifts, 23.50 hours) and Installed Looms		Output on the Basis of 300 Days, 3 Shifts and Installed Looms (tons)
			65% eff. norm	75% eff. norm	65% eff. norm	75% eff. norm	75% eff. norm
Sonali	3676.12	1.88	108.53	94.06	49.57	42.96	8556.78
Janata	2828.46	2.00	95.54	82.80	59.59	51.64	5476.34
Pubali	2823.98	1.84	101.36	87.85	47.60	41.25	6845.42
Fauji	2259.70	2.63	88.35	76.57	50.78	44.01	5134.07
Jessore	3534.39	2.94	81.24	70.40	59.37	52.11	6782.48
Star	4774.09	2.00	90.76	78.66	40.23	34.87	1,3690.85
Afil	2630.89	2.94	65.85	57.07	35.47	30.24	8556.70
Aleem	3052.73	1.59	100.64	87.23	41.16	35.67	8556.78
Eastern	2706.80	2.88	102.29	88.65	36.21	31.38	8625.23
Nowpara	840.61	2.56	72.99	65.45	56.67	40.11	1711.36
Platinum	7023.26	2.00	85.15	73.79	37.58	32.57	2,1563.09
A.R. Hawlader	2681.62	2.00	75.27	65.23	45.20	39.17	6845.42
Peoples	8713.23	2.38	75.89	65.97	41.48	35.95	2,4232.80
Quami	6826.07	2.00	95.91	83.12	47.15	40.86	1,6702.83
Ashraf	2281.30	2.00	79.56	65.95	46.89	40.64	5613.25
Average	3624.80	2.29	87.95	76.17	46.34	40.19	9926.23

Source : Bangladesh Jute Industries Corporation.

cost of production will decline. Empirical results based on least squares regression indicate a similar trend but they are not significant. The degree of variation in average cost explained by that in capacity utilisation is small which indicates that there are many other factors besides, efficient use of capacity which influence the cost of production.

We have also calculated degree of capacity utilisation for Sacking. another product of jute industry. For the year 1972/73, the average degree of capacity utilisation on existing shift basis at 75% efficiency level is 76.17% (Table III). If we compare the findings of 1972/73 with that of 1969/70 and 1968/69 [1], we find that the degree of capacity utilisation for Sacking on the basis of 300 days was 64% for 1969/70 at 75% efficiency level, whereas for 1972/73 it was much lower, only 40.19%. Degree of capacity utilisation on the basis of actual days worked at 75% efficiency norm in 1969/70 as 94% whereas in 1972/73 it was 76%. From Table III, we find that as compared with the average actual output of Sacking of 3625 tons, the potential output was 9926 tons.

C. Engineering and Shipbuilding Industry

There were 33 projects under the control of Bangladesh Engineering and Shipbuilding Corporation (BESC) of which 28 were in operation and 5 were under construction in 1972/73.

Here we have calculated the degree of capacity utilisation of 12 existing units at different efficiency levels. The plants have actually operated one shift only. We have tried to show the extent of utilisation on the basis of actual days worked and on existing shift basis.

There is considerable amount of underutilisation even calculated on the basis of actual working hours. From Table IV we find that the average degree of utilisation on the basis of actual days worked on existing shift (one shift) is 52.31% at 75% efficiency level varying from 12.02 to 71.05%. Degree of capacity utilisation on the basis of actual days worked and on 2 shift basis is more disappointing (average 24.24%). In Table IV we have calculated the degree of capacity utilisation on the basis of desirable days (300) and desirable shifts (2 shifts). On this basis the average degree of utilisation is only 22.32% at 75% efficiency norm.

Almost all the industries under Bangladesh Engineering and Shipbuilding Corporation (BESC) have worked for about 300 days in a year. So in order to

TABLE IV

PRODUCTION AND CAPACITY UTILISATION (PERCENTAGES) OF BANGLADESH ENGINEERING AND SHIPBUILDING CORPORATION, 1972/73

Name of the Enterprise	Products	Production Unit	Actual Production	Actual Shift Co-efficient	Capacity Utilisation on the Basis of Actual Days Worked		Capacity Utilisation on the Basis of Desirable Days (300) Desirable Shift (2 shifts)	Capacity on the Basis of 300 Days and 2 Shifts
					Existing Shift(1 shift) 75% eff. norm	Desirable Shift(2shifts) 75 %eff. norm	75% eff. norm	75% eff. norm
Khulna Shipyard	Inland & Sea Going vessel	Ton	1,331	.99	66.97	33.23	33.01	4,034
Eastern Cables	Cables	Ton	348	.99	12.02	7.41	7.16	4,860
Bangladesh Diesel Plant	Diesel Engine	No	1,353	.94	64.09	30.04	27.84	4,860
Atlas Bangladesh Ltd.	Honda Motor Cycle	No	1,729	.96	61.80	24.77	23.78	7,272
Eastern Tubes Ltd.	Tube Light/Jute Loom	No	42,397	.57	36.28	10.41	5.24	809,353
Gulfra Habib Ltd.	Carding Machineries	No	217	.94	53.37	26.88	23.18	936
Hashim Can Co. Ltd.	Decorated can Lac	Ton	115	.98	52.24	25.60	24.57	468
National Tubes Ltd.	G.I. & M. S. Pipe	Ton	2,800	.94	63.27	29.66	27.48	10,188
Progoti Industries Ltd.	Bus, Truck, Car	No	1,218	.94	57.69	27.05	25.06	4,860
Bangladesh Cycle Tube Ltd.	By-Cycle	No	7,448	.94	35.31	16.55	15.34	48,564
Dacca Radio Electric Ltd.	Radio P.A. Equipped	No	5,000	.94	71.05	33.31	30.86	16,200
Metalex CorporationLtd.	Electric Fans	No	7,939	.97	53.69	26.00	24.53	32,364
Average				.93	52.31	24.24	22.32	

Source : Bangladesh Engineering and Shipbuilding Corporation (BESC).

increase their output, they should give more emphasis on raising shift-coefficient and the level of operating efficiency than on increasing number of days.

D. Inter-industry Comparison

There is some problem in making meaningful inter-industry comparison because of the different basis on which calculation for individual industries has been made. The major difference arises in the number of shifts operated. Basides conceptually different standards of efficiency norms are implicit in measurement of capacity utilisation under existing conditions. However, broad averages in the degree of capacity utilisation will provide directional evidence on the required corrective measures. In addition we need some evidence on movement over time across the industries under study. For this purpose we have used the evidence provided by the Planning Commission [2] which admittedly is rather crude since it is based on a simplified concept of installed capacity without bringing in considerations of shift-coefficient or efficiency norm. The result of this exercise is presented in Table V. We find that the sugar industry records the lowest rate of capacity utilisation and the relative position does not seem to have changed between 1973/74 and 1974/75. However, there has been some improvement in capacity utilisation in all industries under study except for Sacking.

IV. FACTORS RESPONSIBLE FOR UNDERUTILISATION

It is evident from the data of 1972/73 that there was significant underutilisation of capacity in the industries of Bangladesh. Although one of the main reasons for that period was the war-devastated state of economy, there are many common reasons for LDCs which hamper the desired level of utilisation of capacity and which seem to persist in the case of Bangladesh as reflected in Table V.

1. Paucity of Foreign Exchange: Like other LDCs the industries of Bangladesh face great difficulty due to shortage of foreign exchange, which creates bottleneck, among others, in the supply of necessary raw materials and spare parts without which the industries cannot possibly run in full capacity. In 1973/74 the Jute Mills under Khulna zone lost on an average 43938 loom hours due to shortage of spare parts [5]. All industries under study suffered in various degrees from lack of necessary foreign exchange allocation, the worst victim apparently being the Engineering industry. The difficulties remained even in 1974/75. As a

matter of fact, some of the enterprises suffered severely from a shortage of strategic indigenous raw materials. For example, in the case of the sugar industry the problem has been seriously aggravated by lack of wagon space, as well as leakage of sugar-cane into alternative uses.

TABLE V

DEGREE OF CAPACITY UTILISATION (PERCENTAGES) OF SELECTED INDUSTRIES OF BANGLADESH

Industry	1972/73	1974/75
1. Bangladesh Engineering and Shipbuilding Corporation	51.65	59
2. Jute Manufacturing Industries		
a) Hessian	61.62	68
b) Sacking	76.17	72
3. Sugar	47.67*	58

*1973/74

Sources : Tables I through IV for 1972/73 and [2] for 1974/75.

2. Market demand for the product: It was found that for some goods market demand, both domestic and foreign, is limited. So production has to be restricted to the extent of demand. Domestic demand is limited due to the lack of private and public purchasing power. Another bottleneck for domestic demand is constituted by uncoordinated imports of goods and services despite the existence of adequate indigenous availability. This indicates a lack of import substitution measures and results in the creation of considerable excess capacities. Products under this category are cables, G.I. pipe, super enamelled copper, tube light, jute machinaries. decorated can, aluminium utensils, welding electrodes etc.

3. Imbalance of machinery: For some industries capacities for complementary processes of operation are not in balance with one another. For some processes capacity is more than for other processes, which causes internal

imbalance thereby leading to overall underutilisation of capacity. This was found to be the case for Chittagong Steel Mill.

4. Welfare implications (in the case of expansion of multiple shift-work): There are some welfare implications of increased production by expanding shift-work. Although expansion of shift-work may increase production without increase in capital which is more scarce, it can not always be prescribed considering the health of the worker. Also physical condition of work is not always favourable for multiple shift-work. Instinctive dislike of night work and difficulty in obtaining transport at unusual hours, may stand in the way of increasing shift-work. Psychological condition of workers and work also is not always favourable. There may be domestic problems, separation from the family and friends etc. There is also difficulty in sleeping during the day time under the environmental conditions as existing in our industrial locations. There is also skilled labour deficiency for special types of job. Managerial difficulties are also responsible in some cases for underutilisation of capacity.

5. Failure in power supply: There is considerable loss of production due to frequent power failure and voltage fluctuation. As for example, during July-February, 1974/75 the loss in output due to power failure in some selected industries was, 15.83 lakh yards of cloth and 15.9 lakh pounds of thread under cotton textiles, 7,034 tons of jute goods and under Food and Allied Corporation, 1.15 crore taka worth of man hours (i.e., 1,12,693 man hours) [2].

6. Among the other reasons for the underutilisation of industrial capacity, mechanical/maintenance trouble, strike/*gheraos*, weaver shortage, yarn shortage etc. are also important. In 1973/74, for the jute industries under Khulna zone, the loss in loom hours on an average was 56095, due to mechanical and maintenance trouble, 6184 due to strike/*gheraos*, 42,289 due to weaver shortage and 54,322 due to yarn shortage [5].

What clearly emerges from this study is that there is considerable underutilisation of capacity in various industries of Bangladesh and the situation is not likely to improve unless serious attempt is made to remove the basic causes identified above.

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Book Reviews

Industrial Concentration and Economic Power in Pakistan, Lawrence J. White, Princeton University Press, Princeton, New Jersey, 1974 (pp. 212+xii).

The book under review was conceived with the problem of industrial concentration and economic power in mind, a problem which arise from barriers to entry into industry in the form of scale economies, absolute capital requirements, scarce factor control in the production stage and of high tariff and/or outright quotas for competitive imports at the marketing level in the Pakistani context of large-scale industrialisation on the basis of active, indeed sweeping, but unequal governmental promotion. While it is one thing to be conceptually aware of the fundamental and intractable problem of monopoly—oligopoly in a less developed country, it is quite another to identify the exact causes, the probable extent and the inevitable consequences of such industrial formation. It is thus entirely fitting that White's purports to answer the above three implied questions : he at once makes a productive contribution to the understanding of industrial organisation in a predominantly private enterprise economy, Pakistan.

While Chapter 1 is a necessary warm-up to the subject containing an account of the structure of the book, Chapter 2 presents the general problem of industrial concentration, defining relevant terms as it progress. Substantial sub-sections are devoted to show how fairly common aspects of industrial promotion in a typical LDC context might restrict entry and promote concentration, what the economic effects, static and dynamic, of that concentration are conceptually likely to be, and finally what the non-economic implications of the whole thing might be.

Chapter 3 is a brief overview of the pattern of industrialisation and trade policies in the 1950's and 1960's in Pakistan, leading to a treatment of how an increasing awareness grew as to the problem of escalating concentration and thus to an account of the promulgation of the Monopoly Control Ordinance toward the end of the latter decade. Thus putting the subsequent discussion into an appropriate historical context, the author seeks, in Chapter 4, to identify the magnitude of the overall concentration in the manufacturing sector in Pakistan. In measuring overall concentration, the choice of control as opposed to ownership as the basis, and in measuring control of assets the choice of total assets as opposed to total capital employed are refinements having this reviewer's full approval. The focus has always been on 43 families particularly known for industrial and

cognate wealths in Pakistan. White's methods are careful in that he measures overall concentration on various measurement scales. The empirical standing of his work is substantially enhanced since the measurement scales do not materially change the estimated concentration.

But the complete structure of an industrial sector can not be described without knowledge of all industries in terms of their individual sizes and numbers. Furthermore, similar disaggregated knowledge is warranted for firms in an industry before structure of a given industry is to be described. White certainly goes part of the way towards attaining the desirable disaggregation in Chapter 5 where he estimates concentration by industry. Although sales is a better index of actual market power than capacity, limitations of data dictated the choice of the latter as a proxy for sales. But, by default, White was able to compare firms within each industry, enabling him to go almost the whole length toward the desirable disaggragation. The result is that the author is able to conclude that leading families effectively controlled the leading firms in the leading industies in Pakistan and that is the anatomy of concentration in industry.

White identifies in Chapter 6 the principal barriers to entry into Pakistan's manufacturing to lie at production stage and belong to the category having to do with scarce resources, having early in the chapter convincingly argues against scale economies as belong a major explanatory variable of the observed degree of concentration. His contention that the wealth and connections of large industrial families enabled them to pre-empt scarce resources (principally the import licenses for essential capital and intermediate goods) and further that the levels of licenses for these families correlated directed with family asset size at the beginning of the licensing period is, I think, well argued. White turns in Chapter 7 to deal with the effects of concentration. As elsewhere, he again displays his considerble awarensess of analytical and empirical caveats. Through a series of regressions, he brings out the economic effects of concentration, carefully bringing to surface data imperfections as he progresses. Profit rates, concentration and licensing stringency are found positively related, while neither profits nor capacity utilisation seems to have been among the criteria for sanctioning entry. The chapter ends with a treatment of how economic concentration was increasingly spilling over into areas of political power, which partially explains the unusually low personal income tax efforts in Pakistan.

To deal with the intertwined knot of monopoly power, economy power, political power and income distribution, White suggests in Chapter 8 a policy-set which I would dub as non-interventionistic, competitive, freeish-trade-oriented. But is it also "realistic" as he claims ? May be. It all depends on one's value

judgements. On page 175, he says that "The monopoly-oligopoly position is frequently based on active government intervention in the economy. The best policy is always to remove that intervention" (emphasis added). Not necessarily. The monopoly-oligopoly position is in fact based on wrong government intervention. The best policy is therefore always to set that intervention right. At a more specific level. White argues on page 174 that movements aways from a realistic exchange rate, the absence of licensing, and modest tariffs "are very likely to lead to Petras' 'socialism for the rich". Inspite of the impressive references cited in the footnote on the same page, let me say that Hong Kong, South Korea, Taiwan and Singapore has each achieved, apart from other notable things, socialism for the foreign rich. Whether such a policy-set is realistic or not, it undoubtedly is capitalistic.

All said and done, White's is really an important contribution to an empirical debate with great political interest for Pakistan in particular and other LDCs in general. The book exudes high analytic standards and intimate knowledge of Pakistan's industrial organisation. It surely enhances the position of White as a serious and productive student of industrial organisation.

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The Appraisal of Development Project : A Practical Guide to Project Analysis with Case Studies and Solutions, by Michael Roemer and Joseph J. Stern, New York, Praeger Publishers, 1975 (xxi+223 pages).

The book is one of the latest contributions to the relatively controversial area of project appraisal in the less developed countries (LDCs). Purporting to be a practical guide, it has the merit of combining both conceptual analysis of the principles of project appraisal and their actual applications to a number of hypothetical case studies. Of the two component parts, with four chapters in each, the authors devote the first to the constructs of project evaluation and the second to case studies in the context of the Ghanaian economy. An additional relative merit of the case studies is that they cover all the important sectors of the economy, e.g., mining, manufacturing, agriculture and transportation.

The first chapter gives a useful review of the theoretical essentials of project appraisal, drawing attention to their respective caveats. Problems arising from the treatment of imperfections, large projects, taxes/subsidies are duly raised and discussed. However, on p. 15, the authors seem to put more faith than I is justified in the sensitivity analysis as effectively dealing with the margin of error

surrounding the estimates of social prices, thus leading to the conclusion that "The argument on the precise social value of a particular factor is not crucial to the analysis of the project in question". I should question this relative complacency since it may well be that the initial estimate of the social price of a very crucial factor say unskilled labour, around which sensitivity analysis is to gyrate, may be either too high or too low vis-a-vis the precise social value. In this case, even sensitivity analysis will be sensitive to this initial bias.

Moreover, is the statement (p. 12) that "royalty payments in local currency are not a social cost since they do not reduce the availability of such service to others" necessarily true? What, if these payments in local currency increase with output levels—a fairly plausible outcome where the foreign investor exercises considerable market power. Note that in such a case even royalty payments will become social costs since all other projects in a given line of production may not be able to pay the rising royalties, thus leading to some reduction in the availability of such services (assuming of course no monopolistic price discrimination by the foreign investor).

The second chapter is mainly methodological, consisting of elementary algebraic exposition of net present value, benefit-cost ratio and the internal rate of return. Chapter 3 is probably the most important in the first part, since here the authors outline the theoretical considerations underlying the estimation of social prices for the principal factors and apply them in actually specifying values (or range of values) thereof. The authors spend sometime in computing a shadow wage rate (SWR) for Ghana and the following observations of principle are directed, not only at their methodology but, at the general problem of computing the SWR in labour-surplus LDCs.

SWR for unskilled labour of a project essentially involves the calculation of the opportunity cost of labour, and especially rural labour. One needs therefore a thorough analysis of rural labour market. But it is strictly necessary to go beyond analysing that market in isolation but see it in the general context of a continuing interactions between the market for labour and that for other assets, notably land, and institutions. Given this, the authors' estimation of SWR, based on prior estimates of market wages and the assumption that the Ghanaian rural labour market is probably competitive (p.66), may involve a systematic downward bias if, as may well be the case, such market is in fact monopsonistic. Note that Ghanaian agriculture is largely export-based (p.80), that such exports are based on cocoa (p.90) and further that the distribution of incomes (and, I think, land, too) of cocoa farmers is highly unequal (p.92). Thus, if relative monospony prevails in Ghanaian rural labour market and since minimum wage

legislation in the rural areas is known to be non-existent, then the market wages may understate competitive wages and thus the resulting SWRs may systematically underestimate true opportunity cost.

Chapter 4 is a very brief but useful overview of the Ghanaian economy. Each of the four subsequent chapters deals with hypothetical but realistic case studies based, respectively, on the mining, agricultural, manufacturing and transportation sectors of the economy. These are quite useful as means of importing actual computational practice with respect to commercial and social appraisal, given my above reservations. In each chapter, a range of relevant practical problems are raised related to the projects in question, and then solutions given, whose details are provided in comprehensive worksheets.

Finally, the book is an elementary but useful manual for development economists or administrators wanting to carry out project appraisal in practice.

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Bangladesh : The Test Case for Development, by Just Faaland and J.R. Parkinson, London : Hurst & Company, 1976 (pp. xi+203, £6.50 Hard Cover).

This is the third book published on the economy of Bangladesh, coming after the contributions of Dr. A.R. Khan and the participants at the International Economy Association Conference at Dacca. The book has eleven chapters, I and II being mainly an overview of the trends, political and macro-economic, embracing the period 1947 to 1975. One will find some useful empiricism about the Bangladesh economy in Chapter II especially. Chapters III and IV are the most important in the book, and deserving the closest study, since it is here the authors discuss the preconditions for development of the kind the authors think is realistically attainable by Bangladesh.

On the assumption that these preconditions will be met, the authors proceed in Chapter V to forecast upto the year 2000 a pattern of growth for the Bangladesh economy. Their vision is essentially one of development led by a transformation of the rural economy in general, and rice sector in that economy in particular. Their perception of the expert prospects for Bangladesh in the years to come being essentially bleak, their vision of the development scenario is also overshadowed by a continuous and increasing importance of foreign aid. More specifically a test case for development is proposed for Bangladesh defined, mainly, in terms of rural development financed by foreign assistance.

Chapter VI outlines the population problem, as of now and at 2000, and discusses evolution of anti-natalist history, among others, in India and China, followed by a discussion of possible anti-natalist approaches for Bangladesh. The authors conclude, correctly, "the real issue is : can the women and men of Bangladesh be motivated" (to have smaller families) ? But in our view, mere better standards of eudcation, subsidies on simple transistor radio receivers are (pp. 115-16), while important, not sufficient for the desired motivation. What is perhaps equally important, but is not even suggested in the book, is the proposition that a relatively egalitarian basis for sharing the assets and incomes of Bangladesh will, by raising the status to life for the millions of landless labourers and vagrants, much more effectively motivate couples to adopt small family norm.

Chapter VII takes up the agricultural forecasts of Chapter V in somewhat greater detail and the policies necessary to realise them. A good deal of faith is put on the ultimate ability of the high-yielding-variety (HYV) technology to close the food gap by 1985. This forecast seems to us to be rather too optimistic (a) because it is based on little or no awareness on the authors' part of the practical problems of adapting to actual physical/agronomic circumstances the strains developed under controlled conditions or of getting the farmers to adopt the high-cost and high-risk varieties because of tenurial imperfections (a large proportion of farms in Bangladesh is operated by other than owners) and (b) because an effective agricultural extension service that can diffuse practical knowledge of the HYV-techniques on anything like the scale commensurate with the forecasts neither exists at present in Bangladesh, nor is outlined in the book.

Chapter VIII is entitled "Employment, rural development and education". Each of three issues in that title represents very large areas, about which, moreover, there are perhaps more confusions than convictions stemming from established results. These large issues are compressed in only 18 printed pages. As a result, the authors fail, except in the most general terms, to produce the ingredients of possible strategies wherewith to solve or alleviate unemployment problem, to accelerate rural development or to make education more oriented to material production. One is surprised to find that in this chapter, indeed in the whole book, there is not even a mention, let alone a review of the operational efficacy, of the Integrated Rural Development Programme (IRDP) as a rural development organisation, although the IRDP has stimulated some professional controversy about its applicability for Bangladesh as a whole. The last three chapters are, respectively, addressed to industry, trade and aid, and poverty.

In general, the book is structured around a set of forecaste, and therefore is as good or as bad as the assumptions underlying them. The authors frame these

assumptions in the context of the discussion in Chapters III and IV of the preconditions for development. But the difficulty is that these preconditions have been discussed strictly in general terms without outlining their specific implications in anything like desirable details. We give a typical example : on p. 35, the authors state about the management of the nationalised industries, that "the aim must be to create efficiently functioning enterprises that can manage their own affairs and avoid outside interference". Fine enough. But this is obviously a long-run aim since, as the authors rightly stated barely a sentence back, "in present circumstances, extensive government intervention in the affairs of the nationalised industries appears inevitable". As far as efficiency and growth *now* in the nationalised sector is concerned, the long-run precondition noted above is not so much important as the modalitiies of a transformation from existing extensive control to pragmatic decentralisation.

As it stand the book appears somewhat unbalanced. While agriculture and population are taken up for extensive treatment, what is lacking is a really serious and analytically rigorous consideration of an institutional framework which will be more conducive to agricultural transformation than in the past. The important issues of land reform and income distribution are almost completely excluded from explicit treatment, except for merely two pages (pp. 143-44) on the distributive implicatious of the HYV technology. The level of discussion in many places is conjectural. Part of this of course is due to data problems, but part is also to not being really being up-to-date with published results on the Bangladesh economy. One may only assume that the word 'bank' appearing in Bangladesh Shilpa Rin Sangstha Bank on page 35 is a misprint, for the Sangstha is not a bank!

In short, in our view, the book falls far short of the potential awaiting itself, given more competent knowledge of how the economy was, and should have been, managed perhaps, the visiting Economists had not stayed long enough, and tried hard enough to know the Bangladesh economy before they could productively write a book on that country as a test case for development.

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Linear Programming and Agricultural Policy: Micro Studies of the Pakistan Punjab; Edited by William O' Jones' Food Research Institute, Stanford University, California: U.S.A., Volume XIV, No. 1, 1975 (pp. 105).

This volume of the Food Research Institute Studies consists of six essays. They all employ the Linear Programming (L.P.) technique to get answers to various problems of agricultural development in the Pakistan Punjab.

In the preface, Carl H. Gotsch gives the background to the essays and says that apart from being treated as research work these essays may also be used in classroom lectures on L.P.

The first essay, also by Carl H. Gotsch, is called "Traditional Agriculture in the Pakistan Punjab: The Basic Model". Gotsch identifies water (canal flow), land, labour, bullock power and the cropping pattrn as the important factors in the context the Punjabi agro-climatic features. He sets up a linear revenue maximising model subject to supply constraints of these factors. Using data on South Central Punjab he tests the model and finds that the model solution is similar to the existing practice in many respects and different in some. For example, the model solution suggests only wheat as the winter crop. But in practice barley, oilseeds and grams are also grown. Interestingly enough the model answer suggests a lower cropping intensity than found in practice. This only indicates that the model specification suffers from its usual fault—that of omitted variables. However, the model does manage to throw up water as the most important and scarce factor. A simulation of the model with a Persian Wheel as a supplementary source of water shows that a 30% increase in cropping intensity can be achieved. Increase in bullock power is shown to be not sufficiently profitable. These latter simulation results appear to be more useful.

The second essay, "The Green Revolution and the Economics of Punjab Agriculture" is by Carl H. Gotsch and Walter P. Falcon. This essay attempts an anatomy of the green revolution. Two new activities are added to the basic model of essay one. These are tubewell operation and HYV wheat, rice and maize cropping. These two additions are seen to offer a substantially different solution than the traditional agriculture model of essay one. With sufficient tubewell water being available, rice drives cotton out of the crop cycle. The wheat-rice (both HYV) cycle exhausts the year. This cycle is so profitable that even perennials like orchards are driven out.

The Second section of the essay deals with the pricing policy of the agricultural inputs and products. It finds that domestic prices are highly distorted compared to world prices and so the cropping pattern and its consequent resource allocation is also distorted. The implication of distorted water prices on the long run position of the acquifer is also studied. The authors do not take up any side in the public-private debate in water management, but point out the issues involved in each case. They however, point to the possibility of a public-private mix in the management.

"The Economics of Tractor Mechanization in the Pakistan Punjab" by Bashir Ahmed is the third essay. This also uses another variant of the same basic

L.P. model. Analysis is restricted only to HYV crops and tractors are introduced both in place of bullocks and along with bullocks. The Persian Wheel as a source of water has been dropped. So only the economics of combinations among bullocks, tractors, tubewells and canal flow waters (as in the basic model) have been worked out. The model solution understates the cropping intensity under both the bullock-canal and tractor-canal combinations. In the other combinations the model solution indicates the profitability of a much higher cropping intensity than is existent. The economic effects of a thresher and the effect on employment of the various technology packages is also studied. The model solutions in this regard are corroborated by survey findings. The effect of various factors is studied in a systematic manner and discussed in a lucid language.

Essay number four is by Muhammad Naseem and is called "Credit Availability and the Growth of Small Farms in the Pakistan Punjab". As the title suggests the main focus of this essay is on the question of credit—how it affects the farming practice in general. The exercise is carried out under assumptions of varying levels of credit availability, varying rates of savings and interest (on credit), varying product prices and so on. All the calculations are done on two bases—(a) on a two season (one year) cropping plan basis and (b) on a eight season (four years) cropping plan basis. The latter basis seems to be quite arbitrary. No reason is provided. Why should the cropping plan deviate from the pattern amenable to the seasons cycle which repeats itself every year and not every four years? The exercise for the one year period, calculating net returns on different levels of credit seems to be quite useful—because it is very detailed.

The fifth essay is "Technical Indivisibilities and the Distribution of Income: A Mixed Integer Programming Model of Punjab Agriculture" by Carl H. Gotsch and Shahid Yusuf. This essay attempts to quantify the extent to which the lumpiness of some capital inputs (tractor, tubewell etc.) cause inequealities in incomes. In theory these factors are also highly divisible like seeds, fertilizer etc. But in practice the co-operative use which is supposed to make these divisible, is missing. So these inputs cannot take on fractional values making Integer Programming necessary. The question asked is simple. Given a farm size and the historically allotted canal water supply for that farm, what is the optimal equipment package which the farmer should buy. The solution shows that for a 12.5 acre farm (apparently 12.5 acres is the representative farm size in the Pakistan Punjab) the net revenue generated would be 91% higher if equipments were divisible. Only at around 75 acres farm size does the lumpiness of capital become unimportant. If tractors are priced at shadow prices, it is found that the net revenue differential between small and other farmers reduce significantly. Certain policy issues emerge from this analysis. Designing and building of

smaller tractors and pumps, pricing tractors at scarcity prices and lower interest on credit are suggested to reduce the gap between small and other farmers.

The exercise produces the optimal equipment packages for different farm sizes from which the adverse implications on income distribution become clear.

The sixth and the last essay "Linear Programming and Agricultural Policy: Summary and Suggestions for Further Work" is again by Carl H. Gotsch. This essay is mainly a summary presentation of the results of all the previous essays. It also suggests a few areas where further research should be taken up the question of water management being the most important among them.

The essays included in this volume certainly shed much insight into the problems of agriculture in the Pakistan Punjab. They also indicate the possible revenue maximizing solutions. However, the volume as a whole is unnecessarily big. The work of all the essays is overlapping to a large extent. All the essays have been worked out within a partial equilibrium framework and as such a number of important factors have been left out. For example, the question of fertilizer has been completely left out. Given a more comprehensive framework these and perhaps even socio-psychological factors could have been taken into account. The second essay suggests the elimination of the perennial orchards and introduction of rice. If the psychological constraint in favour of orchards (because it is traditionally prestigeous to have an orchard in the Punjab) was taken into account, then probably the model solution would have advocated measures for increasing fruit yields for exports.

On the whole the volume is a good guide to an approach to micro-level research, particularly if the analysis of any particular aspect of the agricultural problem is the area of interest. Abstracting from merits or demerits of the L.P. techniques, the volume is valuable for the student or researcher who wants to grasp techniques of applied programming.

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The Three Great Struggles in the Chinese Countryside: A Case Study

PART II

by

A. Z. M. Obaidullah Khan

III. STRUGGLE FOR PRODUCTION AND SCIENTIFIC EXPERIMENT

> The year before last our team was assigned the task of levelling and reclaiming 14 mou of land. It was winter then. The squad members responsible for the work dug for two or three days with picks and shovels. But there was not much progress. Some of us then said, 'this is capital construction, we should ask the brigade for tractors to level the land'. On hearing this, some other members seized this living idea. We held a study class. We recounted the earlier days of our commune when we wanted to construct our own boring rigs for tubewells from scrap-iron, cast-away wrenches and used pipes. Some, then, ridiculed us, 'look at the frogs trying to have goose-flesh'. Others said, 'well-sinking needs expertise. How can we do it'? But we persevered and won. The same question had come up again. Should we rely on ourselves or should we depend on foreign aid? We studied Chairman Mao's call to learn from Tachai.[58] What does that mean? Self-reliance and hard work. This group study raised our consciousness. During the Spring Festival we started our battle. We worked so hard that in spite of the bitter cold we could hardly keep our shirts on. Within a week we levelled more than thirty mou of land and planted maize. How could this happen? Well, we strengthened our will-power and determination and the objective situation was changed through a change in our subjective outlook,

so said Comrade Tu Kai, a member of the team in the Yellow Sandhills Commune. Nothing new that travellers in China have not heard.

But let us analyse the underlying concept of self-reliance under three broad heads: first, ability of the members in the production or community

[58]Tachai is the famous brigade which has been held up as a model for agricultural organization in China. It is situated in the rock-strewn, loess encliffed ravines of the Taihang mountains in Northern Shensi. The brigade leader Ch'en Yung-kuei is a member of the Central Committee of the Party.

organization to make decisions about economic activities within the area or the control over production exercised by them; second, the extent to which the local organization has freedom from external assistance and vice versa, the extent to which the communists have developed an independent technological base for carrying out the economic activity.[59] Again the method followed will be citing from the narratives of commune members, some of which will be self-explanatory and some from which I shall draw brief inferences.

Comrade Ying Wei-chin, chairman of the Commune, stated as follows:

Although formal ownership of land is vested in the commune, the production teams are really the owners as far as utilization of the land is concerned. The team also owns farm animals, some agricultural implements, carts and wheel-barrows. The team prepares the production plan.

After the produce (this is a vegetable commune) is harvested, the team sends directly the marketable quantity to Peking according to an agreement reached earlier between the Commerce and Trading Department of Peking Municipal Committee, the Commune and the team. The team calculates and distributes the income among their members (within of course the general policy of 'to each according to his work') after deducting the production cost and 25 per cent for welfare fund and 15 per cent for reserve for future investment. The reserve and welfare funds of the team are held by the brigade (this is not generally so for other communes). The rest is distributed by the team on the basis of work points earned by each member. The members, however, are given monthly advances.

The production brigade supervises the teams in making their plans; but more importantly, mobilizes manpower for capital construction projects (e.g., water-conservancy, land reclamation); runs hand-tractor and farm machinery repair stations; allocates machinery to various teams and services the equipment of the teams; supervises the consumer shops of supply and marketing cooperatives for meeting everyday requirements of members and also looks after repairs of hardware, bicycles, etc., the brigade maintains crews for supporting the teams in well-sinking, electrification etc., (now some teams also have such crews); from out of its own resources (from the activities above) purchases new farm tools on the recommendation of various teams; and runs the processing shops for grains and vegetables. It also runs primary schools and clinics.

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[59]See Thomas Weiskopff, "China and India", *Political and Economic Weekly*, Vol. X, Nos. 5, 6 and 7, Annual No. 1975,

The Commune is in charge of overall production plans, mainly as a co-ordinator and as an intermediary between Peking Municipal Committee and the brigade. Intra-brigade capital construction projects or projects which the district calls upon the Commune to implement are organized by the Commune. It runs factories, the two most important being agricultural machinery (or tractor) stations and agricultural implements manufacture and repair plants (a substantial part of the commune's income comes from the factories). The total value of output for the second factory, mentioned above was 2 million yuan in 1970. The Commune plans major investments in industry. It also runs the middle school and the hospitals. At the commune level, there are also the reserve and public welfare funds for preparedness against war, investment in capital construction, diversification of commune economy or in rural industry. (Initially a portion of communes' income used to come from part of the reserve fund of the brigade and teams and there were state loans for investment. Since 1963, the Commune economy is built on the income from its own resources.)

As for investments, normally, if a brigade wants to do anything from its own reserve, it notifies the Commune, but can go ahead with it independently as long as there is no conflict of interest with any other brigade; hence the notification. In case the brigade needs assistance from the Commune level, it submits its plans and with mutual consultations the plan is approved, amended or dropped. Similarly, the Commune is also pretty autonomous, but it keeps the district informed. For instance, the canal from Yung-ting river. The district was kept informed and consulted with to avoid conflict of interest with other areas located down the river.

In fact there is a linkage of plans from below to top and from top to below. Take the case of vegetable production in the commune. The Municipal Committee gives a general plan within the State's overall policy directive (taking grain as the main and striving for all-round development) and distributes targets for grain and vegetables among the districts. This they do on the basis of past experience and indices. The district then assigns targets to the Communes and the Commune further reallocates among the brigades. The teams prepare their own plans. The targets handed down from the top are compared with the teams' plans. There is flexibility in the targets set from the top. If the two figures can be adjusted within the flexible limits, well and good. If not, the brigade will discuss again with the teams and work out a revised plan. The Commune will further discuss with the brigade the revised figures and analyse the reasons for

differences. If satisfied the revised figures will go up to the district and Peking Municipal Committee.

Then, after a lot of discussion back and forth, the plan will be finalized. In other words, the production plan of the teams, the brigades and the Commune are based on the objective reality of the situation, mainly coming up from the masses, and then balanced with the tasks and targets assigned by the State (the term is used loosely sometimes to mean the Central Authority, but mainly Peking Municipal Committee, in this case).

At the brigade level a long-term plan (5 years) is drawn up after elaborate discussions with the members of the teams and assessing the possibilities for growth and for investments in capital construction and side-line projects. The brigades' plans after being ratified by the teams, generally in mass meetings, form the base for the Commune's long-term production plan. It also takes into account the Commune's own resources. This is sent up to the district, and thus the district knows the estimated resource position and possible investment capacity of the Commune. But this is only a tentative plan. The operational plan is the annual plan. The tasks and targets tentatively fixed by the district for the Commune within the framework of the regional plan have their bases mostly on the Commune's long-term plan and the experience of the previous year. The district leadership comes down to the Commune frequently for meetings, discussions and 'squatting-in' visits. Every six months the Commune sends up performance reports to the district. So the tasks generally assigned are quite realistic and there is a substantial margin for flexibility. This is what Chairman Mao calls 'Great concentration and great dispersal'.

Ours being a vegetable commune, we have more cash resources than some other communes in the interior or in the mountainous regions. We have mainly relied on ourselves to implement both capital construction projects and the setting up of factories and side-line enterprises. The state also assists That is mainly in the form of materials and other logistic support including. technical assistance. We, of course, pay for the materials that the state supplies. We get a preference price. How do we decide about investment in factories or rural industries ? First, we draw our own plan within the overall policy guideline of becoming locally self sufficient in producing agricultural implements and repairing that we cannot produce ourselves. This includes processing plants for agricultural produce, small scale enterprises for bacterial fertilizers, insecticides or plant hormones. We train up our worker technicians by sending them to plants in Peking and on the job.

For investment in industries to support local agriculture, we are free to decide for ourselves. When we have generated further capacity and resources, we notify the district. The state then may suggest some task and supply materials for manufacturing and processing of items required by it. For instance, the state advised us to go in for the production of bench-drills, oil-pumps for motor vehicles and miniature motors. Before deciding to go in for manufacturing any item not needed locally, we must know whether the state needs it and whether part of the raw material can be supplied by the state.

Take the case of our brigade enterprises. Members of one of our brigades which produces beans decided to go in for processing the beans into noodles. The necessary investment would come from the brigade reserve fund. The commune notified the district about the plan, and through a sequence of consultations, the plan was approved. After all, the noodles had to be marketed. Take a different case. In 1966 district leadership asked the commune if we could set up a chicken farm. A meeting of all the brigade leaders was called to discuss the proposal. The brigade leaders in turn discussed with team leaders and ordinary members of the teams. After discussions spreading over more than a month we agreed that Chao chiao brigade would be the most suitable for such a farm. In October 1967 the brigade established the chicken farm by converting some old hot-houses into chicken sheds. There are now 200 sheds, mostly of mud, a few of brick, built through self-reliance. The brigade members assembled two incubators. Some materials for these were supplied by the district commercial bureau, but much was fabricated locally from used materials. The farm supplies 30,000 chickens a year to the Peking Oil Cereal and Foodstuff Import and Export Corporation. For chicken feed the commercial department of Peking supplies the brigade with 4 million catties of high quality chicken feed a year. This supply is pegged to our supply of chickens. In setting up this we acted within the overall policy guideline of utilizing side-line occupations for all-round development. The state suggested this particular project according to its requirement. We agreed and implemented the project mainly through self-reliance in designing and setting it up, utilizing the birgade's own fund. So you see the interrelationship between the policy, the overall state plan, the regional plan and local plan and implementation. As Chairman Mao says, 'it is better to have initiative from both rather than one'.

The production plan is very closely connected with the ensuring of supplies. The Supply and Marketing Cooperative (a state organ) responsible for

ensuring supplies, bases its purchase plans on the basis of the production plans of teams and brigades. The salesmen and shopkeepers go to the teams, investigate and draw up a tentative plan in consultation with team members. These are then consolidated and checked with brigades' and communes' resources. The purchase plan is then sent up to the district for allocation of materials. The commercial bureau of the district Revolutionary Committee checks the plan and finds out what is available and where and accordingly instructs the commune about allocations. Then we purchase directly from state corporations or other centres. Sometimes it may happen that certain commodities cannot be supplied. Then the district in consultation with the municipal trading department, and more particularly the Commune, provides substitutes. As for delivery of supplies, the cadres of the supply and marketing cooperative of the Commune work out with various production teams the detailed time schedules.

There are 53 major centres and shops in the commune for ensuring supplies. After the Cultural Revolution the management of each centre was placed under a committee comprising representatives of brigade leadership, representatives of poor peasants from the teams, and representatives of shop workers. Further, the workers in commerce take part in production, particularly during busy seasons. Thereby they can understand the production needs better. The producers, the poor peasants, also go and stand behind the counters during their off-times. In the past we had the contradiction between agriculture and commerce. If the commercial workers heard complaints from the producers, they felt unhappy and sometimes ignored them. Now we are gradually trying to understand the linkage between commerce and production. How does commerce serve agriculture ? Because commerce is the link between agriculture and industry. This is the basic lesson that we are trying to grasp today. In 1971 we supplied 2,200 tons of chemical fertilizers and over 2,000 small farm implements to various teams and 50 medium agricultural machines to brigades.

From what Comrade Ying has told me, mostly self-explanatory, one can infer that in "planning the production processes themselves", there is almost total local autonomy.[60] Production units have freedom of decision on distribution

[60]For an extreme statement on this, see Mao Tse-tung's letter to production team leaders in November 1959. "Output quotas must definitely be translated into reality, you must pay absolutely no attention to directives from a higher level, you must pay no attention to them, you must pay attention only to the real possibilities". Cited by Stuart R. Schram in *Authority Participation and Cultural Change in China.*

of food and wages for work done within the guideline of socialist principle, i.e., from each according to his work. Again as Stavis points out, "when much of the planning and execution is done locally there is a strong tendency for extensive participation in the process". Example : "when the village of Liu Ling (visited by Jan Myrdal) decided to purchase an electric pump, the decision was finalized at a public meeting".[61]

Local production plans and investments are worked out by complex negotiations between different levels, much of the co-ordinating function being done through the commercial departments which are hierarchically interlinked with dual management at the Commune and brigade level.[62] In the allocations of materials as also in financial assistance in terms of loans for local investment, the higher unit of the state organ, Central Authority or Peking Municipal Committee, can no doubt influence the decision-making at the local level. The state can also assist a local-level organization in raising resources for investment, as in the case of the Tachai brigade, by assuring remunerative prices for apples grown there. Benedict Stavis puts it succinctly "For some issues the Centre has great power (mainly broad policy),[63] and for other issues (day-to-day production, distribution and investments for supporting local needs) the localities are virtually autonomous : For still other issues there are negotiations... between the levels or suggestions are made back and forth".

The delicate balance in the negotiations process between the individual, the collective and the state can easily be tilted in favour of the more powerful organ, i.e., the state. An example is that of the Vice Mayor of Peking who forced on a brigade the growing of three crops of vegetables because of his concern about the supply of vegetables to the city. Are there any institutional or other measures to resist such infringements on local decision-making power ?

First, and a most obvious one is the insistence on sending down higher level cadres to the countryside so that they are able to understand the rural situation better and so that for any new policy they can demonstrate the efficacy of it by doing it themselves in a particular area and persuade the local community to change. Stavis gives an interesting example :

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61 See Benedict Stavis, *Making the Green Revolution: The Politics of Agricultural Development in China* (Cornell, 1974), pp. 119-39.

62 See Andery Donnithorne, "China's Cellular Economy; Some Economic Trends since the Cultural Revolution", *China Quarterly*, No. 52, October-December 1972.

63 See also Marianne Bastid, "Economic Decision-Making", in *Authority Participation and Cultural Change*, pp. 159-97: "Although a given body has no right to decide a given matter with full sovereignty, it may give the impulse for a decision to be made by the unit which enjoys the decision-making power in that field..the impulse also amounts to a pledge that a consensus can exist to carry out the decision".

> Every once in a while the masses do not want to do something that the leaders think should be done. For example, the brigade leadership thinks we have to expand the capacity of water wells... to irrigate more land... The masses thought it would be better to increase water storage capacity so that we could use more efficiently the existing water supplies. So we did that ... we could increase irrigation somewhat but not enough. The masses were convinced by the facts and now a great majority of the Commune members think that an additional well is necessary. We will sink it this fall.[64]

Second, and more important, I suggest, is the emphasis on mass organization at the community level, the poor peasants' representative committee or group as the popular organ to be consulted first for firming up the local production plan. It is this organization again which, when active and vigilant, can and does mediate in balancing the requirements of the individual and that of the collective.

And that brings us to the underlying concept for local self-reliance in the struggle for production. Mao in April 1956 wrote :

> The experience of some socialist countries proves that even where agriculture is collectivized, where collectivization is mismanaged, it is still not possible to increase production. The root cause of the failure is that the State's policy toward the peasants is questionable. The peasants' burden of taxation is too heavy, while the price of agricultural products is low and that of industrial goods very high ... except where we meet with unavoidable natural disasters, we should enable the peasants' income to increase year by year on the basis of increased agricultural production".

And further :

> We want unity together with individuality. If local enthusiasm is really to be aroused, every place must have the individuality appropriate to its conditions....Provinces, municipalities, regions, countries, districts, townships, should all possess both (individuality and enthusiasm)....Naturally we must ... tell the comrades at the lower levels that they should not act wildly....Where they can conform, they ought to conform ... where they cannot conform then conformity should not be sought at all costs. Two enthusiasms are much better than just one.[65]

The contradiction between the individual's requirements for consumption, the collective's needs for accumulation, and the state's requirement for producer-goods.

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[64] Benedict Stavis, *op. cit.*, p. 137.

[65] Mao Tse-tung, "Ten Great Relationships", *Mao Tse-tung Unrehearsed*, trans. by Schram (Text I).

industry have been specifically dealt with by Mao in *On the Correct Handling of Contradictions among the People*[66] and the *Draft History of Agricultural Taxes*[67] in 1957. The conclusion arrived at is that "the absolute quantity of taxes and compulsory purchases should remain the same, and the surplus accruing from increased production should be left in the hands of the collectives, to be invested by the collectives themselves".[68] In other words, the state induces the local production organization to modernize agriculture and diversify the economy by assuring that the community can retain the incremented production and thereby consume more and invest more. In this context let us look at the agricultural tax in our Commune. Comrade Ying said : "Agricultural tax takes about 4 per cent of the income. The tax for our areas was fixed in 1953 on the basis of a cadestral survey according to the crops grown on each field. At that time it was fixed in kind; now we pay the money equivalent. In 1963/64 another survey was made and the grain or other crop fields which we had converted into vegetable fields were placed in the relevant category. But no change in the amount of tax for each type of field was made. Since then the tax has remained static although we have converted more lands into vegetable plots. This is why our income has gone up, yet the tax as percentage of income has gone down."[69] If this is true of agricultural tax, Benedict Stavis suggests that today, the rates of grain procurement by the state have not remained as high as earlier (i.e., till early sixties), at least in relative terms. In John Pelzel's brigade the extraction was fixed in 1961 for ten years.[70] Further, while procurement prices have been steadily going up, the price of industrial products, particularly of fertilizers and consumer goods, have gone down.[71] Such a strategy besides minimizing the conflict between the individual, the collective and the state, will make the local community diversify the economy through handicrafts or intermediate technology, livestock, fisheries and afforestation; increase the local capital accumulation and enable the peasants to appreciate what industry and the collective could do for them.

66See Mao Tse-tung, *Four Essays on Philosophy* (Foreign Language Press, Peking, 1968), pp. 79-131.

67See Li Cheng-jui, *Draft History of the Agricultural Taxes of the Chinese People's Republic* (in Chinese) (Peking, 1959).

68Jack Gray, *The Economics of Maoism in China after the Cultural Revolution*, (ed.) Dick Wilson (New York, 1969), p. 132.

69Beside, for reclaimed land, there is tax exemption for three years.

70See John Pelzel, "Economic Management of a Production Brigade", in W. E. Wilmott, *Economic Organization in Chinese Society* (Stanford, 1972), pp. 392-93.

71See Audrey Donnithorne, *China's Grain Output, Procurement, Transfers and Trade.* See also the table constructed by John G. Gurley, *op. cit.*

Thus the basic identity of individual and communal interests "could be realized". On the other hand, the growth of agriculture will spur light industry and "only thus is it possible to accumulate fairly large funds for building a powerful heavy industry...without agriculture there can be no light industry. But it is not so clearly understood that agriculture provides heavy industry with an important market. This fact, however, will be more readily appreciated as gradual

TERMS OF TRADE BETWEEN AGRICULTURE AND INDUSTRY, 1950-70

	(1) Agricultural Purchase Price Index	(2) Industrial Retail Prices in Rural Areas Index	(3) Ratio of (1) to (2)
1950	100.0	100.0	100.0
1951	119.6	110.2	108.5
1952	121.6	109.7	110.8
1953	132.5	108.2	122.4
1954	136.7	110.3	123.9
1955	135.1	111.9	120.7
1956	139.2	110.8	125.6
1957	146.2	112.1	130.4
1958	149.5	111.2	134.4
1970	n.a.	n.a.	166.7

Sources : Nai Ruenn Chen. Chinese Economic Statistics. The 1970 figure is based on information in *China Reconstructs*, November 1970.

progress in....modernization of agriculture calls for more and more machinery, fertilizer, water-conservancy and electrical power projects and transport facilities for the farms, as well as fuel and building materials for the rural consumers".[72] To sum up, instead of "draining the pond to catch the fish" and the one-sided policy of absorbing funds for investment in the urban modern sector from the commune by the use of price differentials, the modern sector should be retooled to support agriculture while the local peasant communities should be encouraged to modernize the rural economy. In the process the "small producer" mentality will give way to a commitment to the collective since modern agriculture needs a larger scale than traditional agriculture. Furthermore, proliferation of state enterprises and concomitant state bureaucracy will "put an insuperable obstacle in the way of the development of the abilities and sense of responsibility" of the

[72] Mao Tse-tung, *On the Correct Handling of Contradictions Among the People*, pp.129-30.

mass of population in rural communities "on which economic vigor in the last analysis depends".[73]

If revolution depends on the broad masses and everybody going into action, then in socialist construction also the commitment of everybody and initiative at the grass roots will prove in the long run more effective than depending on a few urban bureaucrats and technicians issuing orders. Such a hierarchical organization will alienate the producers from the processes of production and the products and further broaden the worker-peasant and urban-rural differential. Hence the slogan for doing away with the four "relyings" : relying on the state for grains, on loans for money, on nature for production, and on assistance for basic construction.

An obvious and inevitable result of such insistence on self-reliance and local autonomy is that there can be significant differences in levels of income in different accounting units. Since my focus here is on the Commune itsellf, rather than regional differences, I shall discuss only briefly the inequalities within the Commune. It is here that the structure of the Commune comes into play. To quote Comrade Ying :

> Let us take the case of one of our advanced cooperatives in the southern part of Hsiang (township). The land was too sandy and there was a shortage of manpower and skills. Some of the households there also needed special help and assistance. Now, with the structuring of the Commune, it is possible to help such teams and households from the Commune's and brigade's reserve and welfare funds.
>
> The Commune also organizes technical assistance to the backward areas and sends skilled farmers from the northern part to the south. The present Yang Fang production brigade, for example, was a backward brigade when we started the commune. Its total output of grain was then 100,000 to 200,000 catties. Now production has risen to 1 million catties. Why? Because with the commune organization, broader in scope, it is possible to balance the needs of poorer areas against those of well-off areas.
>
> Besides, in our Commune, the teams' reserve fund is held by the brigade. This helps proper allocation for such reserves in capital construction projects, not according to a team's contribution or population but according to the real requirements of various teams. Of course, the brigade leadership cannot act arbitrarily. They have to consult with the members of different teams. The Commune has also its own funds and as the

[73]Jack Gray, *op. cit.*

> Commune economy grows, it can assist the less well-off brigades to come to par with the others.[74]

One can also refer to Tao Chu for the future aimed at :

> With the consolidation and development of the economy at different levels of the people's commune, the accumulation at the two levels of the People's Commune and the production brigade should also be gradually increased and commune-operated and a brigade-operated economy will also be gradually developed....In the future, with the raising of the level of agricultural productive forces and the further development of the economy of the brigade and the commune level...the people's commune will replace the system of using the production team as the basic accounting unit with the system of using the production brigade as the basic accounting unit. After a further period...the commune as the basic accounting unit.[75]

Instead of enlarging the "unit of account" by "levelling down" the prosperity of more prosperous teams, the aim is to enlarge the unit and scale of operation by narrowing the gap between the production teams through development of the brigade and commune economy to give the necessary support to pull up the backward teams.

A related aspect of local self-reliance is typified in the decision of the members of a team, for instance, to use picks and shovels rather than ask the brigade for a tractor to break hard ground. Such examples are numerous. However, the massive mobilization of manpower for conquering nature in China sometimes blinds us to the more important aspects of the developmental style, i.e., the subtle mix of what economists call traditional technology with modern engineering and technical inputs, and the integration of technology with production relations and social organization.

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[74]For an interesting recent example, see *Peking Review*, No. 11, March 14, 1975 (p. 22); the case of Li Kuang-ching, secretary of the party branch of Chuang chia chiao brigade in Fengshu Commune of Hunan Province's Taoyuan count who transfers himself from the rich 3rd team to the poor 7th team and helps to grow three rice crops there. "We should not only think of our own rich team : a communist must willingly face up to difficulty".

[75]Tao Chu, "The People's Communes are Making Progress", (originally published in Hung'ch'i No. 4, Feb. 26, 1964, and S.C.M.M. No. 410). Cited by Jack Gray in *Chinese Communism in Crisis*. See also Chang Chun-chiao, *op. cit.*, "On Shanghai's outskirts, for example, income at the commune level in proportion to total income (of team, brigade and commune) rose from 28.1% in 1973 to 30.5% in 1974, that of the brigades rose from 15.2% to 17.2%, while that of the teams dropped from 56.7% to 52.3%".

Let me give an example of harnessing the Hai river. In 1957 preliminary conservation works had been completed in Hai river including Yung ting near Peking at quite a cost. In 1963, there was a peak flood, the water level being higher than in the big flood of 1939. Though the city of Tientsin (flooded in 1939) was saved, the crops were ruined on 50 million mou of land. Then with Chairman Mao's call, "Hai ho must be harnessed", for seven years 400,000 persons were mobilized each winter to dig the canals to lead the water to the sea, build the embankments and roads, do afforestation work and level the land within the embanked area. Through seven winters 1600 million cubic metres of earth have been removed, 21 canals of the total length of 1790 kilometres dug, and 40,000 bridges, culverts and water-control structures built. The figures are approximate, as told from memory without reference to the records by Mr. Pai Lin, a deputy director in the Ministry of Water Conservancy and Electric Power at Peking. What is significant is what I saw in one of the work places on Yung ting river near Peking airport. Here were picks and shovels and wheelbarrows co-existing with bulldozers and tractors, the peasant-worker from the local community and the planner-engineer from the central project works side by side, mechanically powered tubewells and pumps proliferating with vast amounts of human labour constructing canals, dikes and drainage channels.

According to *Peking Review*[76] and Benedict Stavis[77] "in the past few years the dramatic scene of growth has been the improved water-control in the North China plains, the upper Yellow River Valley, and the Yangtze River Valley. These labour-intensive projects...are now increasing and stabilizing yields in North China. One reason...(in contrast to the 1950s) is the widespread availability of new energy sources to move water". Traditional technology, surely, has its limits, but combined with planning input, and sound engineering design its character is totally changed.

The Chinese experience in recent years shows it is possible to convert local manpower into an asset and substantially reduce the cost of large capital constructions by encouraging initiative and resources from both the Centre and the local community.

In the process, the local communes, brigades and teams who are the beneficiaries are actively and extensively associated with both planning and implementation. The plan as a totality and in its relevance to an area is patiently discussed with the people and the leadership there; in some cases, as I have seen,

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[76] *Peking Review*, No. 1, Jan. 3, 1975, "Thirteen Consecutive Years of Rich Harvest". *Peking Review*, No. 5, Jan. 31, 1975, "Reconstructing the Big Sanmen Gorge Dam".

[77] *Op. cit.*

the alignment of a canal has been altered on the basis of the experience of the veteran peasants, their practical knowledge of the behaviour of the earlier floods being respected. Each area has drawn up its own labour input plan according to the varying slack seasons and the local production organizations have of course paid for that. One may call such a mobilization a lavor corvèe and conjure up the regimented toil of "blue ants". The Chinese would like to use the metaphor of ants gnawing at a bone or "many hands making light work" of a seemingly impossible task. One may even quote Shakespeare as Neville Maxwell does in his *Sunday Times* report of December 8, 1974. "Singing masons building roofs of gold".

Surprisingly, Mao has been identified with preferring "mad mobilization" to technology. But if we look at Mao's writings in the 1956-59 period, what do we find? In his famous speech on "The Question of Agricultural Cooperation", he explicitly mentions the linkage of "large scale cooperative farming with.... the tractors...the chemical fertilizers, modern means of transport, oil, electric power for the needs of agriculture".[78] I have already referred to the "Ten Great Relationships" (April 1956) and "On the Correct Handling of Contradictions Among the People". Then there are Mao's speech of January 28, 1958 to the Supreme State Conference[79] and the Sixty Articles on Work Methods of January 31, 1958, where he talks about the new technological revolution following the political and ideological one, of learning "new skills", understanding "science and technology". The proceedings of Cheng tu Conference held in March 1958 stress the need for innovations and improvement of farm tools under grass-roots and not state control. In 1959, he had "put forward a plan for units in every hsien (county) in which scientists, technicians, local blacksmiths and carpenters would be associated with veteran farmers in working out new tools suitable to their locality".[80] One can even argue that while the big leap emphasized variously the planned use of manpower to improve farming techniques, the expansion of small industries through labour-intensive and intermediate technology and the retooling of heavy industry to support agriculture, the gearing of small industries to a "support of the urban industrial sector"[81] rather than the other way round, i.e., agriculture, has been one reason for the failure of the leap. Benedict Stavis cites, among others, Oyuan Chiu, "Overall Planning and Walking on Two Legs, essential to Agricultural Mechanization", "Some (comrades) in the industrial department even fear that any support given

[78] *Political Thought of Mao Tse-tung*, pp. 345-46.

[79] See *Mao Tse-tung Unrehearsed* (Text III).

[80] Jack Gray, *The Economics of Maoism*, p. 125.

[81] See Jon Sigurdson, "Technology and Employment in China", *World Development*, Vol. 2, No. 3, March 1974, pp. 75-85.

to agricultural mechanization would weaken their own strength". Some of them looked on investment in supporting agriculture as a zero-sum game and emphasized private material incentive for increasing agricultural production, while Mao thought otherwise.

The question, therefore, is not mobilization versus technology, but of technology being internal to the production organization and related to the social goal of anti-hierarchy and broad participation, rather than being something exogenous and foreign related to outside control and hence bureaucracy, and of fuller and perhaps more efficient use of the rural labour force and rural savings.

Closely connected with the development of what Mao calls "local industry and handicraft" through the users participating in the learning process thus freeing their minds "from superstitious attitudes and dogmatism about agricultural mechanization", is what Mark Selden calls "Organizational Production" in China. These are state farms developed mainly on reclaimed waste land. In two broad categories, these are farms developed by demobilized troops and the P.L.A. and by urban organizations and the "May 7" cadre schools. They are large. For instance, in Sinkiang alone in 1966, a report mentions the existence of more than 100 farms covering an area of about 4 million acres.[82] Let me quote from a report of my visit to a P.L.A. farm in Shi Hua Tze district, 155 kilometers north of Urumuchi, the capital city of Sinkiang :

> Today after eighteen years of hard work the P.L.A. fighters who came here in 1952/53 had turned more than 2 million mou of waste land into fertile farms. Before the revolution there were hardly 3 households and today there is a population of more than 300,000. Now this area has 13 large collective farms, 11 large and medium factories with 14 small factories to support agriculture.
>
> In one of 13 collectives I visited, there is a population of 35,000 in a total area of 250 thousand mou. Of this, 201 thousand mou are under cultivation, the rest being utilized for factories, housing and water-conservancy and drainage systems. The big farm is divided into 8 sub-farms. There are three reservoirs and an intricated net-work of stone-lined channels. The produce is wheat and maize, sugar-beet and cotton. Agriculture is combined with stock breeding (60,000 head of cattle, sheep and a few horses) and of course there are the factories, sugar refinery, woolen mill and processing plants. Farming is mechanized.

[82]Source : Discussions with Comrade Saifuddin, then the First Vice Chairman of the Revolutionary Committee of the Sinkiang autonomous region and secretary of the Party Committee, on the afternoon of May 28, 1971.

The same is true of the May 7 cadre schools. Whether these are meant for "thought reform" of recalcitrant cadres or for introducing the higher urban leadership to the realities of the countryside to make them "a good primary school pupil of the masses and to prevent self-righteousness and estrangement from the masses", or, as the slogan goes, to rectify the three great divorces from proletarian-politics, from production and from the masses, are interesting but different questions. What I want to posit here is the relevance of such farms as pace-setters both in ideological and technical fields. By virtue of their characteristic of the "ownership of the whole people", they are ideological models for the collectives. On the other hand, mechanization and superior technology and skill have turned them into "big, multi- purpose experimental centres" or key points. One cannot but remember Mao's talk in the later Yenan days (November 1943) : "With these four types of cooperatives of the masses of the people and the collective labour cooperatives in the armed forces, offices and schools, we can organize all the forces of the masses into a huge working people".[83]

Turning back to our Commune, now let us look at a different question : what makes the members of the collective wage the relentless struggle for production? Comrade Ying told me :

> In the early years of liberation our unit output of grain was 150 catties per mou and of vegetables, 2000 catties per mou. In 1958, it doubled. Before the Cultural Revolution it was 400 catties per mou for grains and 5,000 catties for vegetables. Today (1971) our vegetable yield per unit has doubled and grain yield is around 700 catties per mou. Why this rise ? Because of the heightening of ideological consciousness of the masses. Previously we used to put work points or profits in command. Now we do farm work not for work points but for revolution and the collective.[84]

But what does such rhetoric mean in concrete terms ?

"Before the Cultural Revolution work-points really meant a "Labour-production quota", or "standard work-day system" covering both the quantity and quality of work. Payment was made on the piece-work system, say, ploughing one mou of land in a day would earn 10 points, hoeing 9 points, weeding 7 points

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[83]Mao Tse-tung, *Selected Works*, IV, 152-53.

[84]Figures for the total vegetable production given for the Commune :

1949	23 million catties
1958	95 million catties
1965	160 million catties
1971	180 million catties

and so on. The standard was worked out after considering the average work in various fields which can be done by an able-bodied worker in a day. Some work had fixed points. The team or the group leader used to assign the tasks, and since every member wanted to do the work which earned more points, it was often difficult to distribute the work. There were cases of dissent and dissatisfaction among the members, while the few cadres in charge of management could bully or bestow favours. Again, the daily book-keeping and daily assessment tied up the cadres too much to take part in production and unite with the masses. Now (after the G. P. C. R.) it is different. In the monthly meeting, the members of the squads and the team select a model or a norm, the maximum for a full day's labour by a strong skilled man. The criteria for fixing the norm are:

(i) Quantity and quality of work,

(ii) Attitude to labour and the collective,

(iii) Ideological consciousness.

This is done in group meetings. Then against this norm each member reports his or her own work, assesses himself and awards himself or herself work points. If the standard is 10 one may award oneself 9 or 9½. Then the self-assessments are discussed by the group and the points are finalized. It is here that the question of attitude comes up. One can be a hard worker but a lone wolf. One can be disabled like Comrade Tu, yet he never hesitates to take on the difficult task. The moot point is the attitude. As Comrade Chen of Tachai says:

"A man's ability may be great or small, but if he works heart and soul for the public, he is respected". As long as one works conscientiously to the best of his ability and for group interest there is no discrimination between light and heavy work. In some of our enterprises, like the chicken farm in Chiao brigade, the members do self-assessment and calculate rewards once a year like Tachai, but in most of the teams it is a monthly affair. Once self-assessment and mass-appraisal is done, the rest is simple. The norm fixed by each member is multiplied by work-days in a month, thus giving his or her entitlement. At the time of annual accounting the total amount for distribution is divided up by the total number of work points and a cash value for each work point is arrived at. Then a member's work point is multiplied by that value which is his or her share of the collective's income. The monthly advances that the member received and the staple grains that he has drawn are deducted from the annual entitlement.

In our Commune 40 per cent of the grain consumed is distributed on the basis of need, i.e., family size, numbers of young, old and adults.

> This is not free; it is part of a household's income entitlement according to work contribution. Thus, if there is lack of labour power or sickness, a family may find very little cash entitlement at the end of the year. But then we have a mass meeting to decide whether such a family needs assistance from the welfare fund or not. In Tachai, grain distribution is according to need and so no family can go hungry. We are also having meetings to increase the share of grain distribution, but ours is a vegetable commune and we are just nearing self-sufficiency in grains, so said Ying Wei-chen.

Thus, work point or to each according to his work, which is obviously a material incentive, remains, but in a collective framework. Incentives flow from a feeling of solidarity in a context of mutual cooperation rather than individual competition. Judgement is not on what one produces, but what efforts one puts in; not by a hierarchical management but each one participating in it. The emphases are group participation and communal prosperity and the trend towards equality. As the famous brigade leader, Chen Yung kuei puts it (1966).

> Personal reporting and public assessment is in effect a process of self-education, self-examination, struggle between two ideologies and two roads. ... As for public assessment it consists of public commendation and criticism. In making a personal report, a member is required to determine reasonably how many work points he should get.... If he is selfish...and reports work points more than he deserves, he may be in danger of being called selfish or backward by other commune-members. Thus, he has to wage a mental struggle with himself and compare his work with that done by others...the basic thing is assessment of his thought and attitude to labour.[85]

The struggle, then, is for the correct thought and attitude, the correct line, "put the collective before self". In other words, an ethic of communal society. Hence, the linkage between class struggle and struggle for production. A crack squad of young boys and girls in Yellow Sand Hills Commune was asked to grow cabbages in the slack season, i.e., July-September. The period is hot and rainy, the weeds grow fast and of course there are the insects. Some of them thought the objective situation was not suitable for such a task. Then the squad organized study meetings and probed deeply into their motives. They thought the task impossible because it meant more work and less profit. On the other hand, the people in Peking whom they were to serve, needed vegetables in summer. So

[85]Cited by Neville Maxwell in his unpublished paper, "Learning from Tachai", prepared for the Development Seminar, Institute of Commonwealth Studies, Oxford, March 3, 1975.

they realized their thinking and attitude were wrong. They were putting profit first and not their responsibility. "Once the essence of the contradiction was realized", the objective situation no longer posed a problem. "It was hot and raining, yet we planted cabbages. The weeds grew fast, but our speed in wiping them out was faster".[86] In other words, once "people's thinking is revolutionized", physical environment can be changed and difficulties surmounted. Correct "ideas turn into a material force which changes the society and changes the world".[87]

IV. SCIENTIFIC EXPERIMENT

The next question, then, is how and to what extent the community can develop an independent technological base for carrying out economic activity. I shall discuss the question under three broad heads: 1) learning by doing; 2) the new schooling system and 3) democratization of science or mass-movement in scientific experiment.

I) Let me start with the example of the chicken farm in Chao Chiao brigade.

> We sent some members of the brigade to advanced farms in nearby communes and Peking. Technicians from those farms also visited us. These mutual visits are organized both directly and through the district. Thus we gradually built up a cadre of workers. Of the 44 workers, 17 are graduates from the local junior middle school, not from the technical-school. They have assembled two incubators mainly by local fabrication from used materials.

In the case of the now flourishing farm-tools manufacturing enterprise, in 1958, there were only veteran workers from the local handicrafts and blacksmith shops. "We sent some of them to bigger factories in Peking to learn on the job. Today 20% of the workers in 5 workshops of the factory are our own middle-school graduates. Factories in Peking help us to train up our young worker-technicians. The technicians from the large factory often conduct spare-time schools".[88] For a more recent example, *Peking Review*, No. 9, Feb. 28, 1975 reports about 240,000 workers studying theory in more than 1500 spare-time schools. Courses are given by workers cadres technicians and some full-time teachers in combination with the needs of the three great revolutionary movements for studying revolutionary theory, technology and raising cultural level.

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[86]Source : Ing Yu-fang, a young girl of 18, middle school graduate and squad leader in a team of Yellow Sand Hills Commune.

[87]Mao Tse-tung.

[88]Source : Comrade Ying Wei-chen.

Briefly, then, local self-reliance has its important educational fall-out in spread of technical skill in the rural areas. State supports through technical assistance and mutual assistance programmes, while standard blue-prints of machines and machine-parts are readily made available.[89] More importantly, the drive for broad peasant participation in the process encourages continuous improvisations and innovations. The attempt is to bring about a fundamental change in the traditional fatalistic and superstitious attitudes, and has its roots in the Maoist faith that "the boundless creative power of people" which if given the opportunity can create "more and more undertakings for their own well-being".[90]

II) Obviously, in this attempt, the schooling system plays a most important role. What is it like in this commune particularly after the Cultural Revolution? The following is a summary of what Comrade Liu Yu-fang, Vice chairman of the Revolutionary Committee of a middle-school of the commune, and her colleagues told me.

1. The school, a junior middle-school before is in 1971 middle school.
2. Instead of the previous twelve years of schooling 6, for primary and 3+3 for junior and senior middle, it is now ten years, 5+3+2.
3. Of the 32 members of the teaching and working staff (there are 450 students in 3 grades and twelve classes) two are poor peasants teaching the students practical farming and politics.

Beside, there are 40 part-time teachers, veteran workers from factories, old peasants, women team leaders, militia men who come to the school to teach special subjects.

4. Previously, the leadership of the school was in the hands of the head-teacher and the director of discipline and of course the school parts branch. But the school authorities had no direct link with the poor peasants either at the brigade or the commune level. They were directly responsible to the District Education Bureau. Now two representatives of the Poor Peasants' Committee of the commune are permanently stationed in the school. (The primary schools are run by the brigade from its own resources and the teachers are paid in work-points like any other members of the brigade.) Under the leadership of the school's party branch they exercise leadership in implementing Party's policies. The party-branch has five members, two commune cadres, two teachers' representatives, one representative from the Poor Peasants' Committee. It is closely linked with the commune's

[89]In 1958, more than 100 standard designs were made available to rural counties and communes and played an important role in giving a basis for the rural industrial development.

[90]*Quotations of Chairman Mao*, (1967 ed.), p. 119.

Party Committee and education group. The Revolutionary Committee which manages day to day affairs of the school has 9 members: two leading cadres, two poor peasants' representatives, two students' representatives and three teachers' representatives. The school is run and managed by the local commune though part of the salary of regular teachers comes as state assistance.

5. The cultural courses include Political History and Geography, Mathematics, Language, Physics, Chemistry, Basic Knowledge of Agriculture and Industry, Revolutionary Art and Physical Culture. Since 1970 five special courses have been instituted to suit local production requirements at the request of the Poor Peasants' Committee. These are:

a) Agricultural mechanics and soil science
b) Accounting
c) Masonry and Carpentry
d) Electricity
e) Medicine and Public Health

Students may choose one or two of these special courses.

Teaching materials for these courses are compiled locally. The materials for the other courses are compiled by a group at the municipal-level with suggestions going up there from various rural and urban schools with Peking Municipal Committee.

6. For two years before 1966 none of the teachers and students took part in organised physical labour. Of course some students helped their families. Now, while teaching the students the art of composition, for example, the boys and girls are taken out to a work-site. The teacher and students take part in physical labour and hold discussions with the workers, and then write about the experience. Thus, along with the learning of how to write logically, the value of labour is also realized. Previously teaching was divorced from reality and production. A school-graduate having learnt kinetics on the black-board could not find out what was wrong with a motor in a pump-house when it stopped working. Now, the class-room and the work-shop and school-farm are like twins. Beside, the students go out and work in the commune or brigade enterprises and factories and the farms in production teams. The teachers also go and work with the students. Thus, the teachers can make "concrete analysis of concrete conditions" in relation to teaching needs.[91] Students now do class-room studies for 31 weeks a year. Eight weeks are spent on practice in industry

[91]See *China Quarterly*, No. 48, Oct.-Dec. 1971, p. 633. As Donald Munro puts it, "A teacher who involved himself in a given area sufficiently to know its features is engaging in social practise. In brief, he no longer thinks of children in general; he thinks of children with specific cognitive localized vocabulary problems and knowledge needs and particular attitudinal problems. His teaching approach is varied accordingly".

and agriculture, 3 weeks for militia-training and around 8 for rest and holidays. The holidays and practice in agriculture are fixed according to busy seasons of the commune and brigades.

7. Previously there was a practice that a teacher should be imposing and exact and the students should obey whatever he commands. This authoritarian and feudalistic heritage was further reinforced by slavishism in the name of discipline. The school had before more than one hundred regulations with a director looking after discipline only. Now, there is no such director, and most of the regulations have been repudiated. Students themselves follow a conscious discipline. If there are problems, teachers, students and Poor Peasants' Representatives hold meetings, put up positive examples, hold study-meetings and resolve them. There is a fundamental *change in the teacher-student* relationship. To give an example, there is a teacher whose relationship with the students in the past was so tense that they used to compare their relationship with her as cat and mouse. One day, this teacher found the students drawing cat-heads on the black-board. She felt insulted and thought, "it is unfortunate to be a teacher". On coming to know of this incident, a member of the party branch visited the teacher and studies with her the essay "On Contradiction". Then he said, "a cat is out to eat up the mouse. This is a contradiction between the people and the enemy. You are regarded by your students not as a friend but as a cat". That very afternoon the teacher herself called a meeting and the teacher, students and workers attended. She made a self-criticism and the students also criticised themselves for their pranks. Thus a new unity was achieved on the basis of comradeship. The previous teaching method was that of "stuffing the duck" and now it is of "elicitation". Teachers teach and the students also mount the platform. "Officers teach soldiers, soldiers teach officers and soldiers teach each other". In this context there has been a radical change in the examination system. Instead of examining on the basis of crammed up book knowledge only and holding back students or even dismissing them from the school, the attempt now is to find out how best the students have been helped in grasping a subject and applying such knowledge in practice. The teacher and the students jointly prepare problem-sets. Then a student evaluates himself, other fellow-students join in the assessment, teacher gives his remarks and so does the Poor Peasants' Representative. The entire performance of a student is evaluated, professional skill, ideological consciousness and attitude to fellow-students (cooperative or otherwise) and to labour.

8. Finally, students after graduation from the middle-school normally go back to their brigades or teams or to factories and sometimes outside. The allocation is done within the framework of the state and communes' requirement

but through continued consultations among the school leadership, the brigade and commune leadership, the students and their parents. Then some of them settle down on the farm, some become workers on the factory, and some who want to go for higher studies apply to the team or factory leadership where the candidate or candidates are working. The leadership evaluate the quality of such candidates' work, his or her attitude to labour and to the masses as well as his performance in the school. They then present their recommendation to the masses or the group with whom the candidate has been working for final selection, and approval. In other words, the new intellectual must unite with and serve the masses.

Much of what has been said above are self-explanatory. But to repeat the key points, first, there is community control of rural education thereby making it more relevant to local production-needs; second, the teachers, no longer, are the aloof literati while the past heritage of three-door-students, school to college to office, is being deliberately broken; third, the students are being made more responsive to the community and aware of local needs; and fourth, the values of command-obedience relationship and hierarchical structure are being consciously substituted by participatory and basically anti-hierarchical relationship.

It is these school graduates who are the king-pins of scientific, experimental teams at the village or production team as well as brigade level.

An interesting report on "Peasant-College Graduates—Peasants" can be seen in *Peking Review*, No. 7, Feb. 14, 1975, pp. 13-15. Commune and brigade leadership send their bright young peasant students to Choyang Agricultural College. Class-room study alternates with actual work on the field. Thus students are able to contribute to production even before graduation. After a three year course, the peasant graduates return back to the commune and take up leading posts in the commune, brigade or team experimental station. "Their clothes are covered with dust and mud and their hands are calloused. These are the agro-technicians we need", so said an old peasant.

III) But what is meant by the "scientific experimental group" at the village-level ?

"Take the case of growing two crops of potatoes in our team", so said a veteran member of a team. "Till year before last (i.e., 1969), we used to grow one crop of potatoes. We harvested our potatoes in June-July. So, we could not use the seeds next year. For seeds we had to depend on North-East China where harvesting is done in September-October; and because of that (the cold weather) the seeds could be preserved and used for our March planting. There

were lots of problems. The transportation cost was heavy. Sometimes the seeds were in short supply. So we thought we should grow two crops of potatoes. Immediately after the first harvest in July we selected the seed and planted a second crop in our experimental plot, to be harvested in October. Our first experiment failed. We got together and analysed the reasons for our failure. We found that the second planting time, July, the seeds get easily rotten in the heat. We asked what part of the seeds gets rotten? The starch on the surface. So, next time we selected the seeds immediately after harvest, cut those into pieces and put those in a well of cool water for 10 hours. This took the starch on the surface out. Then we planted the seeds densely under a shed. As the seeds started sprouting, we transplanted them. The success rate this time was more than 60 per cent. Now that we had learnt that the losses were due to temperature and rains, we experimented to find out the temperature at which the seeds would grow best. We found out that the seeds when first planted would be below a certain degree centigrade. We then removed the seeds to a green house, placed them layer on layer and controlled the temperature. As the seeds started sprouting we transplanted them on the field. That was late August and the temperature was already cooling down. This time 90 per cent of the seeds bore fruit. Yes, all the experiments were done by us. We have a scientific experimental group in each team. It is a three-in-one combination, veteran peasants, cadres and our young intellectual the middle-school graduate. We have similar group at the brigade level. One of our brigades has produced its own insecticide, 920 and bacterial fertilizer 5406. At the commune level there is also the experimental station. But, the personnel of the station now work under the management and supervision of the commune leadership. Some of them are seconded from the Peking Research Institue, while some come to work with us and sum up our experience".

One can, obviously, argue that this is no research, that agriculture, once it begins modernizing, needs basic research in providing fertilizer-responsive high yield varieties or in coping with disease problems which h.y.u.s. are prone to. But, first we do not know enough of higher research in China and second, there may be a case for decentralized research partially controlled by and responsive to local production needs.[92] In such effort, the important element to my mind is the fact that here is an old peasant who till 1966 could not read and write, and after two years of attending night school, can now read 150 characters, is participating in an exercise in scientific analysis.

In this context, I shall summarize the main points that came out in my discussions with the Director and responsible cadres of Peking Research Institute in early 1972 :

[92]See Benedict Stavis, *op. cit.*, pp. 264-65. See pp. 157-90 for a detailed discussion.

1. The Peking Research Institute is engaged in a number of specialized research on farming, forestry, vegetable-growing, animal husbandry, aquatic products and agricultural machinery. The research-workers and technicians give guidance to the peasants in Peking area (rural population under Peking municipal committee is 3.7 million). Two-thirds of the research workers go to rural areas, investigate and select subjects for research in accordance with the problems of production that peasants feel need to be solved. The experimental bases are set up right at the production-team level and the research is carried out together with local poor peasants. In the past, for instance, wheat breeding was done in the laboratory. Now, the equipments and breeding materials are carried to the experimental bases in the villages. While in the past, it took about 10 years to breed a new variety, now it takes half the time. A new maize variety has been successfully evolved and adapted in 3 years time. This is because of moving the experiments from the laboratory to the field. The close combination of research and production helps in popularization and faster adoption-rate by the peasant. Example, the Institute had before developed a levelling instrument suitable for the wet fields, but the peasants would not use it. Since the research workers have moved out to the rural areas it has not only been possible to introduce the new instrument, but necessary improvements made also, to meet the practical conditions on the field.

Again, some of the research-workers working in the Yellow Sand-Hills commune (under the commune leadership) helped evolve a bacterial fertilizer to meet the fertilizer shortage. (Radio-active fungus from the root of a fodder-crop (alfalfa) is inoculated into cotton or vegetable seed cake and mixed in the soil, the ration being 6 caltis of seed cakes with 100 caltis of soil. The treated soil of 100 caltis is equal in nutrient value to 1000 caltis of farm-yard manure.) The technicians also worked with peasants to solve the problem of an early cotton plant, frost-free period being rather short. In sum, this is like science walking on two legs, laboratory work supported by and drawing problems from production on the field. The research worker and the practical farmer work together, one's expertise and the other's experience reinforcing each other. Technicians instead of "farming with their lips" actually do it in the peasants' fields.

2. At the commune and brigade level Agricultural Research station or group carry out work in mainly three kinds of fields : a) experimental fields; b) high yields field and c) seed-propagation field.

Following the three-in-one combination, technician, cadre and veteran peasant, they attempt to solve mainly the difficulties arising from local production. In the experimental field a series of tests are carried out in farming technique, density of cropping, introduction of new seed-strain, fertilization water-use etc.

The high yield field is a demonstration plot. In the framework of Mao's eight-point charter—deep ploughs, adequate manuring and fertilization, water conservancy, good seed, close planting, plant protection, tools-reform and field management—the attempt is to find out the law governing high yields in production, so as to set up an example for the various teams and other areas. Such example has helped in popularizing inter-cropping, transplantation of wheat increasing yield by even 40 per cent, and even hybridization of seed strains. One commune Tun' Pi-wa has had success with five maize varieties and they have been widely adopted. Seed-propagation field is for multiplication of good seeds for production use.

3. For popularization of advanced techniques or new seed-strains, on the spot meetings are convened; experiences exchanged by visits of peasants of nearby areas; advanced experiences summed up by the research staff are printed in pamphlets or book-lists and broadcast over the radio; and rural exhibitions are organized. Regular meetings are also held among the different levels, the production team, brigade and commune groups and Peking Institute. (At the central level the Academy co-ordinates the regional efforts and hold conferences to sum up the experience.)

4. Finally scientific research activity is a mass-movement, a people's war. Thus everyone is being encouraged to actively join in "to solve a group of problems" through "experiments with a strict scientific attitude".[93] Members of a traditional rural society in transition and change participate in the processes of change and bring the change about themselves. No doubt, basic research and higher technology may not always be compatible with such mass-movement approach, but this approach has its basic function in achieving a communal commitment to asserting man's dominance over the objective world and transforming it thereby. To sum up, practice, theoretical and technical education through production oriented formal and informal schools and a mass-movement for experimentation are the three major ways by which technological base in the countryside is being expanded. The stress is on community-control with the outside or the State supporting and not dominating. The methodology of three-in-one combination in scientific experiment (as also in organization structure) is to broaden participation and extripate bureaucratic tendencies. It recognizes technical expertise, but blends it with politics by enlisting the active support of the peasants. The

[93]Mao Tse-tung, Draft decision of the Central Committee of the Chinese Communist Party on certain problems in our "rural work", May 20, 1963 in Richard Baum and Frederic C. Tieweo : *Ssu-ch'ing : The Socialist Education Movement* (Berkeley, 1968). See p. 70 and pp. 58-71.

participation of youth ensures revolutionary momentum, resolves problems of upward mobility and stabilizes rural leadership with young blood constantly flowing in. Underlying all this is continuous and permanent struggle for revolutionization of man's attitude and social behaviour, or what Mao calls "the re-education of man". In Comrade Ying's vocabulary (quoting Mao) ideological consciousness and correct subjective world out-look can transform matter, the important aspects of such outlook being a collective psychology based on rationalized morality, a conscious drive for equity and vigorous popular participation. The struggle, between aspiration and present day reality, between deterioration and advancement is ubiquitous and permanent and assumes a "bold resolve which dares to make the sun and moon appear in new skies".

V. CONCLUSION

The case-study, presented above, is perhaps a study of aspirations rather than achievements. But, there are examples of such aspiration being realized in certain areas in the Chinese countryside. Analysis of these examples is, perhaps, necessary to understand the poetry which Mao and his peasants are trying to write. The attempt can be summed up in the concept of "struggle-criticism-transformation". This concept implies a process which has two distinct phases, first struggle-criticism, second transformation. The first relates to the dynamics of a revolutionary situation, the second to its consequent resolution, and the process goes on continuously. The principle assumes the inherent existence of conflicting ideas the struggle between the two outlooks. But, the relativity that "Contradictory aspects can transform themselves into their opposite" postulates the immense capacity for change, and infinite possibility of human achievement in the struggle for material progress. The principle is valid for specific situations and ideally calls for a collective effort by the people to make themselves aware of all aspects of a given conflict. It also implicitly lays down the guidelines for the correct appreciation of the rights and wrongs involved in a given situation. The guideline seeks to consolidate a consciousness that induces an individual's total commitment to organized collective effort and establishes an identity between individual and collective thinking. Such an outlook works against elitism and tends to remove social distinctions. In theory there is no special distinction for professionalism as no job is more prestigious than another; none for leadership *per se*, as all authority resides in the masses. There is no special status attached to the city because everyone goes to learn from the countryside, none for *a priori* knowledge, because it grows from social practice. That being the ideal, one can only speculate whether revolution in China will continue or settle down into a comfortable Weberian society. Admittedly, the future is always uncertain and

human history never entirely predictable. But the realities of today are the concrete aspirations and efforts, problems and failures of the peasants in Yellow Sand-Hills commune. They are changing and the change may well prove permanent.

"Reach the ninth heaven high to embrace the moon
Or the five oceans deep to capture a turtle; either is possible.
.....
Under this heaven nothing is difficult,
If only there is the will to ascend".

(Mao Tse-tung, *Chingkang Shan Revisited*, 1965.
Transl. by Jerome Ch'en.)

A. Some Basic Figures about Huang Tu Kang Commune

I. General :	1958	1965	1971	
Population	26,000	30,000	34,000	
Households	6,100	6,800	7,600	
Able-bodied workers	11,000	12,000	14,000	
Acreage (mou) (1 acre=6 mou).	56,000	45,000	45,000	
(The decrease is due to land being taken over for households, factories, side-line enterprises and water-conservancy works.)				
Private plots			2,200	mou
Pigs (private and collective)	18,000	24,000	41,000	(almost 1 per mou of land)
Total gross income (in 1,000 Yuan) excluding income from private plots, pigs or private side-line occupation	6,660	9,730	11,000	
Total expenditure (taxes, production cost, investment capital constructions)	2,800	3,600	4,900	
Accumulated reserve	780	950	1,050	

II. Irrigation and Mechanization :

A. Irrigated area	1949	1970
	17,000 mou	43,000 mou

In 1949 there were 2,500 shallow open wells. Water was drawn by buckets either manually or using pulleys. In a day one could irrigate one mou of land this way. By 1958, the number of wells came down to 2,100. But, 190 were deep wells with pumps run both by electricity and diesel power. There were 25 diesel engine sets and 1700 persian wheels. Today there are 600 wells, all electrically operated. A major irrigation channel has been dug with a length of 35 kilometres while another channel of 17 li (1 li=1/3rd of a mile) draws sewerage from the city both for irrigation and fertilization.

B.	**Ploughing Implements**	1952	1958
	Ploughs	68 single blade ploughs (most of the farming being done by hoes and spade	220 double-blade ploughs drawn by draught animals. and manual labour).
	Tractors	1958	1970
		3 (each 7-10 h.p.)	73 (53 are walking tractors and 20 are 35 to 45 h.p. tractors)

C.	**Transportation**	1949	1958	1965	1970
	Carts (Horse or mule drawn)	170	420	n.a.	600
	Trucks	2	n.a.	28	50

D. Sprayers (both mechanical and hand)

1949 31

1970 250

E. Threshing Machines 120 sets

III. Electric power was first brought in 1956, mainly for agricultural use, in a limited way. In 1958/59 the commune extended the lines. In 1959, it set up 20 kilometres of high-tension transmission line and 131 kilometres of low-tension line. In 1963, the total of high-tension line was 31 kilometres and of low-tension line, 246 kilometres. Now all households have electricity. In agriculture the pumps are electrified. Besides, there are the factories, workshops and side-line enterprises, all using electric power. Initially the State paid for laying the grid and the limited-extensions. After the commune was set up, the commune itself paid for both high-tension and low-tension lines and transformers. The State maintains the high-tension line, while the commune is responsible for maintenance of low-tension line.

IV. **Living Conditions :**	1949	1958	1970
Rooms	99	550	No records. But each household has at least one room.
Bicycles	497	1,700	8,000
Thermos flask	350	6,200	n.a.
Transistor radio	nil	n.a.	Every family has one.

The commune has two film projecting machines and 14 public broadcasting stations. It has also set up 20 television centres.

V. **Education :**	1949	1958	1970
Pupils in primary schools	980	5,600	8,900
In Middle schools	100	3,300	3,400**

** (in the three middle schools of the commune. There are others studying in Peking.)

In University	2	30	No cumulative figure. In 1970, alone the cummune had sent 30 young people to study in the University.

There are few records about literacy. But according to the figures available for 1959, 5,500 adults had become literate by that year. Now there is more than one Political Night School in every brigade.

VI. Medical Care :

	1949	1952	1959	1970
Doctors	3 (private)	18 (private)	35 (State)	250 (medical workers of whom 200 are barefoot doctors)
Clinics		2 (private)	4 (State)	11 (brigade level)
Hospital				1 (commune level).

Fertility Decisions and Desires in Bangladesh: An Econometric Investigation*

by

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I. INTRODUCTION

There are many reasons and possibly as many explanations why human fertility varies within and between societies. Attempts to identify and measure the relative contributions of the various factors that influence fertility have not been very successful in differentiating among the existing large number of competing explanations. This gap of knowledge in explaining fertility behaviour is especially great in the case of developing countries, where it poses an important obstacle to formulating population policies that are consistent with an acceptable conceptual framework. Recently, economists have presented a framework for the analysis of fertility decisions within the context of a general theory of choice [4; 24; 25; 26]. Economics as a study of choices is concerned with the allocation of scarce resources, including time, for achieving desirable ends. As Demeny puts it eloquently, "No restriction was imposed by the discipline as to the nature of these desirable ends so long as it could realistically be assumed that the ends were convertible to each other—in other words, so long as prices could be assigned to them, even if in concept only" [5, p. 125]. The basic insight of this framework is to conceive of children as providing services, an optimum of which can be secured by any couple through both market and non-market transactions. It can be argued that this new framework provided only elegance and theoretical rigor to an already existing insight in the social sciences. The notion of the interdependence and trade-offs among

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consumptive, productive and reproductive activities within the household had been suggested a long time ago, as for example, power's explanation more than half a century ago for the decline of the Roman Empire :

> The new obvious manifestation of Roman society in decline was the dwindling number of Roman citizens. The Empire was depopulating long before the end of the period of peace and prosperity which stretched from Augustus to Marcus Aurelius... 'the human harvest was bad'. It was bad in all classes, but the decline was most marked in the upper ranks, the most educated, the most civilized, the potential leaders of the race.... Why... did this civilization lose the power to reproduce itself? Was it, as Polybius said, because people preferred amusements to children or wished to bring their children up in comfort? Hardly, for it is more marked among the rich than the poor and the rich can have the best of both worlds [21, p. 3].

The basic insight and elements of the modern economic theory of fertility are clearly implied in Power's discussion, although not elegantly stated. The current revival of interest in articulating the thoery seems to be mainly derived from the need of (and pressure on) policy makers to identify policy parameters and tools that can effectively influence current trends of population growth, especially in the developing world. There are conceptual problems, however, with the current theory that are still, subject to active empirical and theoretical research [23, pp. 81-124]. For example, there is difficulty in accepting this theoretical approach as a basis for explaining completed family size. The reason lies partly in the theory's neglect of sequential decision-making. It deals with a static world in which the couples' preferences do not change over time or in response to changes in the family composition. Nor does it allow for uncertainties or incomplete information [10 ; 18]. In this paper, we use the model as a framework within which we organize our thinking, subscribing to the notion that fertility can be fruitfully analyzed within a framework of individual choice. However, we perceive decisions to be influenced by factors other than economic variables including social constraints that limit individual choices. Empirically, we attempt to examine the relevance of the theory in explaining both completed family size and sequential decisions as indicated by the desire to have additional children in Bangladesh.

The question of what determines fertility in Bangladesh is an important policy question the answer to which is vital to this country's development aspirations. Given the country's resource base, present high rate of population growth and the high level of fertility exert tremendous pressures on Bangladesh's social and economic development potential. The nature and extent of these pressures has been

documented in many recent studies and needs no additional elaboration on our part [13 ; 22]. Efforts to control or maintain this rapid rate of population growth have not been very successful. However, it is evident that the problem of "demand" constraints is central to the success of such efforts [29]. But demand factors are embedded in the social structure and cannot be tackled in isolated efforts [7, pp. 260-82]. One of our main objectives in this study is to examine how among other things, income, education and female labour force participation affect long-run fertility behaviour. To do so we estimate a system of simultaneous equations. We also examine short-run fertility behaviour in a sequential decision framework. We hope that the study will have implications not only for the development of an adequate framework for thinking and analysis, but also for evolving some guidelines for policy.

We are aware, of course, that a particular regression equation could be interpreted in the vocabulary of several theories. For example, the levels of many social indicators are very low in Bangladesh and accordingly their effects may not be as predicted by theory. An increase in income from a level below subsistence may increase fertility. The mechanism through which it does so could be mainly improved nutrition which in turn influences both fecundity and early marriage. The possible effects of malnutrition on fertility have been cited by Chen and Chaudhury [3] and the income effects in the formal sense of the theory might be quite negligible. Similarly, female education and labour force participation may be proxies for theoretical constructs other than the hopothesized price effects. For example, threshold values may be required before these variables affect the formation and modification of fertility preferences for large segments of the population. Female education may reflect changes in the opportunity cost of time as well as in the relative status of women, their socioeconomic group membership or their tastes in general [16]. In such cases a national finding that depicts no relationship between female education and fertility does not necessarily contradict the existence of a strong negative relation within a small segment of the population with a higher average value of female education, say among an urban elite [2]. It is evident that the social context should be kept in mind when interpreting the regression coefficients and especially when deriving policy recommedations.

In this paper we attempt to develop two models of fertility behaviour in Bangladesh. The first model attempts to explain the total number of children "ever-born" to a couple in Bangladesh. The second examines sequential decisions in fertility behaviour by attempting to explain the wife's desire for an additional child. In both attempts, we are faced with conceptual and methodological problems. In the first instance, there is the problem that completed fertility, income

and female work are all simultaneously determined over the life cycle. It is known by now that ordinary least squares techniques are not appropriate for estimating these individual relations. In the second instance, the dependent variable (the desire for additional children) is dichotomous and the structure of the expected relation is not necessarily linear. In our present analysis we shall draw attention to the models and estimation techniques presented in earlier work by the two senior authors [14; 15].

Section II discusses the theoretical framework which underlines our study. Section III is devoted to a brief discussion of the data sources. Section IV presents the plan of analysis. Section V presents variable notation, the model of completed family size and results from its estimation. In Section VI, we present the model and results for the desire for an additional child. Finally, in Section VII, we offer some concluding remarks.

II. THE THEORETICAL BACKGROUND

We begin by presenting the bare-bones outline of what has by now come to be known as the "Chicago-Columbia" approach or the "New Home Economics". In this section, we shall rely heavily on our previous formulation [14; 15]. For more details the reader should consult the various references given below. In its simplest form, economics is the theory of choice among competing ends in order to maximize satisfaction or utility, subject to input constraints. In order to study household decisions within this framework, the maximand and the constraints must be specified. The way this specification is done, along with additional assumptions, determines the form of possible conclusions. Following Nerlove [18], we can specify the four elements of the theoretical structure of the new home economics as follows : (1) a utility function with home-produced bundles of satisfactions as arguments; (2) a household production technology; (3) an external labour market for transforming household resources into market commodities; and (4) a set of household resource constraints consisting of inherited material wealth; and time of different qualities that is available to individual family members for market and non-market production. More formally, each couple is assumed to solve the following problem :

Maximize $U(Z)$

Subject to

(i) $(Z, x, t_m, t_f) \in P$

(ii) $p.x=0$

(iii) $t_f.i=T=t_m.i$

(iv) $x, t_m, t_f \geq 0$

where U (.) is a couple's common utility function whcih summarizes their preferences defined over various services $Z(z, \ldots z_n)$ they enjoy over their marital life T years. These services are typically produced within the household by the couple's household technology P using as inputs x of market commodities and vectors t_m and t_f of the various kinds of time available to the husband and wife respectively. (ii) is a constraint on the couple's market transactions. The commodities bought have a positive sign and those sold have a negative sign. For example, x_i could be the wife's market labour and P_1 the wage she receives. The variables in (iii) set the time budget constraint. Thus t_f could be a vector summarizing the allocation of the wife's time to different activities. i is a vector, all of whose components are unity. If we now identify one of the services enjoyed by a couple over their married life as those due to children, the relevance of the framework becomes obvious. Thus a couple decides through constrained utility maximization not only how much food services, cloth services, recreation services, etc. it will enjoy, but also how much "child services" it will consume. These child services can be viewed as being produced by their number and quality. Thus fertility is essentially reduced to lie within the calculus of choice depending on the prices of other commodities and especially the price (shadow price) of time. It is the value of time, its differential within the household and changes over time, that is pivotal in deriving conclusions about fertility decisions. The value of time also serves as the main link between household and the economy. Young children are highly intensive of the mother's time relative to other activities and relative to the male partner's time. Thus, one immediate implication is that a rise in the cost of mother's time for the family should cause a shift away from children towards less time-intensive goods, while changes in male wages represent a predominantly income effect. The role of education is introduced to the extent that it serves as a proxy for the relative costs of time.

Of course, the above theory is merely suggestive, and as we mentioned earlier, it provides benchmarks around which we can organize our thinking. We do not subscribe to the Chicago-Columbia approach in the narrow sense of exclusive reliance on economic variables; nor do we adhere to a particular interpretation of the theory. In addition to the economic variables we rely on a set of sociological and demographic variables paying special attention to those variables which can be persuasively interpreted in terms of an alternative framework, as for example the effect of nuclearization of families on fertility and the role of sex preference on fertility decisions. We shall return to these issues again when we develop our models for explaining the total number of children "ever-born" to a couple (Section V) and the desire for an additional child (Section VI). But first, a brief description of the data source.

III. THE DATA

The analysis is based on cross-sectional data on 3088 currently married women under the age of 50 years obtained from a national survey (Impact Survey) conducted in Bangladesh in 1968/69. The design of the Impact Survey followed closely the conventional design of extended KAP-type surveys. It had, however, some important modifications such as more socioeconomic information, a detailed pregnancy history and interviews with both husbands and wives in a household. The universe of the sample consisted of all households in Bangladesh(except those in tribal areas). The sample was multistage and internally self-weighted within rural and urban strata. For more details on sample selection, see [12; 20; 27].

IV. PLAN OF ANALYSIS

The remainder of this paper confronts the data described in Section III to the theoretical scheme summarized in Section II. In the following section we make use of a model developed earlier [14] to explain the total number of children "ever-born" to a couple in Bangladesh. In the model we attempt to take account of some of the simultaneity inherent in the various facets of family behaviour over its life cycle. As such we are attempting a literal interpretation of the theory. However, we are faced with other serious problems. The particular variables to be selected should be relevant to life cycle decisions since we are concerned with completed family size. For example, the relevant income variable should be the total expected discounted wealth of the couple when they first married. Since we lack data which adequately reflect this theoretical concept, we have to resort to inadequate proxies. There are other more fundamental problems with this literal an interpretation of the theory : a utility function and a technology that do not change over the life cycle and the assumption of perfect knowledge. More generally, sequential decision making which allows for learning and adjustments is totally ignored [10; 18].

In Section VI we attempt to meet some of these criticisms by an alternative interpretation of the theoretical scheme. Instead of dealing with choices over the whole life cycle we reduce the choice domain to a particular point in time, the demand for additional children at a given point in the life cycle of the couple. In this case U(.) becomes a utility function which summarizes the couple's current preferences and is defined on a vector Z of services that the couple hopes to enjoy in the immediate future. Thus we shifted our emphasis to the short run. This alternative sequential decision approach sets aside the problems of simultaneity we attempt to incorporate in our analysis of completed family size in Section V.

V. MODEL FOR COMPLETED FAMILY SIZE

We consider a simultaneous equation system that treats four variables endogenously, namely birth, mortality, income and female labour force participation, and includes fourteen exogeneous variables. First we introduce the variables and their notations and then specify the complete model.

Endogenous Variables

C : Total number of live births.

D : Number of dead children.

Y : Current monthly income in Rupees (1969).

P : Dummy variable which takes the value 1 if the wife has ever worked or is currently working at anything other than housekeeping and zero otherwise.

Exogeneous Variables

H : Dummy variable which takes the value 1 if a house is owned and zero otherwise.

L : Dummy variable which takes the value 1 if land is owned and zero otherwise.

AD : Dummy variable which takes the value 1 if the income during the past 12 months was adequate or more than adequate and zero otherwise.

AF ; Age of wife in years.

AM : Age of husband in years.

A : Age of wife at marriage in years.

EM : Education of husband in years.

EF : Dummy variable which takes the value 1 if the wife is "literate" and zero otherwise.

T : The time in minutes that it takes for the wife to go to a "medical place".

F : Dummy variable which takes the value 1 if the wife is "aware of family planning" and zero otherwise.

U : Dummy variable which takes the value 1 if the respondent lives in a rural area and zero otherwise.

N : Dummy variable which takes the value 1 if family is nuclear and zero otherwise.

C_5 : Dummy variable which takes the value 1 if there is a living child less than 5 years of age and zero otherwise.

EC : Dummy variable which takes the value 1 if any child has gone to school and zero otherwise.

Model Specification

Let I denote the intercept.

1. Equation for Births

$$\beta_{11}Y+\beta_{12}D+C+\beta_{14}P=\gamma_{10}I+\gamma_{11}EF+\gamma_{12}EM+\gamma_{14}L+\gamma_{15}H+\gamma_{17}AF+\gamma_{18}A+\gamma_{19}N+\gamma_{110}EC+\gamma_{111}F+\gamma_{112}AD+\gamma_{114}U+u_1$$

2. Mortality Equation

$$\beta_{21}Y+D+\beta_{23}C=\gamma_{20}I+\gamma_{21}EF+\gamma_{22}EM+\gamma_{23}T+\gamma_{27}AF+\gamma_{28}A+\gamma_{29}N+\gamma_{214}U+u_2$$

3. Income Equation

$$Y+\beta_{33}C+\beta_{34}P=\gamma_{30}I+\gamma_{31}EF+\gamma_{32}EM+\gamma_{34}L+\gamma_{35}H+\gamma_{38}AM+u_3$$

4. Equation for Female Labour Force Participation

$$\beta_{41}Y+\beta_{43}C+P=\gamma_{40}I+\gamma_{41}EF+\gamma_{42}EM+\gamma_{44}L+\gamma_{45}H+\gamma_{47}AF+\gamma_{49}N+\gamma_{412}AD+\gamma_{413}C_5+\gamma_{414}U+u_4$$

Our concern in this model is with factors affecting completed family size. We are dealing, however, with cross-sectional data covering couples at various stages of the life cycle. First, we restricted the analysis to couples with a low probability of having any more children—where the wife is between 35-49 years old. We further restricted ourselves to those couples who indicated no desire for additional children. Finally, we removed from our sample all couples who had no live births or no living children. The final subsample comprised 265 couples.

We shall examine briefly the theoretical rationale for our model specification, especially the birth equation. Note that ideally we should construct a measure of "child service" rather than child quantity alone. A variable indicating child quality should have been used as endogenous in the system. We felt, however, that there is strong normative limitation on the trade-off between child quantity and

quality [6] and that such limitation holds with more force in Bangladesh. Our measure for child quality EC is used as an explanatory variable and its coefficient γ_{110} is expected to be nagative.

Our next concern relates to the construction of an adequate income variable. Apart from monthly income (and house rent if the house is not owned) we have "yes-no" information on whether a couple (i) has any savings from the past two or three years, (ii) finds their income adequate, (iii) saved any income last year, (iv) owns a house, (v) owns agricultural land. We used current income Y as our basic income concept and supplemented it by using some of the above variables as explanatory variables.

Next, we consider the price effect mainly as it refers to the wife's time. The argument simply stated implies that the higher the wife's education, the higher is her income foregone and accordingly the higher the price of a child. We feel that the possibility of a strong price effect in Bangladesh is small because of the low level of female literacy and because the cost of childcare for a working mother is rather limited given the type of female work opportunities and inter-and-intra-family role allocation. However, we introduce the variable P and EF to take account of these price effects, if any.

Finally, we introduce the variables T, F and EM to approximate the household technology especially in the production of children. Total number of dead children D represents the *ex ante* probability of child survival. The demographic variables A and AF are also introduced in the context of the household technology.

The specifications of the equations for the other three endogenous variables, Y, D and P are beyond the scope of this paper. Note, however, that with the exception of the income variable, P and D are consistent with the life cycle interpretation of our theoretical scheme [14].

We use the two-stage least squares technique to estimate the parameters of the model. As one of the equations is exactly identified and the remaining two are over-identified, this is the appropriate technique [9; 30]. Our main estimation difficulty has to do with the female labour force participation equation since P is a dummy variable and as such the assumptions necessary to deduce the desirable properties of two-stage estimators are violated. We ignore these complications. For a recent investigation of the problem, see Mallar [17].

Results of the Model of Completed Family Size

Our results are presented in Tables I and II. Table I presents results for all four equations. First, we examine the equation for births, highlighted in Table II,

TABLE I

MULTIVARIATE ANALYSIS FOR TOTAL LIVE BIRTHS FOR COUPLES, WIFE AGE 35-49, WHO WANT NO MORE CHILDREN : ALL BANGLADESH, 1968-69 (N=265)

Variables / Equations	I	EF	EM	T	H	L	AM	AF	A	N	EC	F	AD	U	C_5	$\hat{C}$	$\hat{D}$	$\hat{Y}$	$\hat{P}$	R^2
1. Live Births																				
2SLS+	-25.11*	0.25	−0.66		0.10	0.08		-0.23	0.58*	0.20	-0.53	0.03	-0.75*	0.38*			1.00*	1.83*	0.57	
	(2.51)	(0.13)	(0.39)		(0.17)	(0.36)		(0.27)	(0.27)	(0.13)	(0.36)	(0.07)	(0.36)	(0.13)			(0.16)	(0.90)	(0.66)	.3550
OLS++	3.88	0.13*	-0.06		0.10*	-0.17*		-0.03	-0.03	0.06	0.30*	0.01	-0.11*	0.03			0.56	0.13	0.01	
	(2.29)	(0.05)	(0.06)		(0.05)	(0.05)		(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)			(0.50)	(0.50)	(0.05)	.4632
2. Mortality																				
2SLS	-0.77	-0.12*	-0.01	-0.02				0.21*	-0.12*	0.02				-0.02		0.14*		-0.03		
	(1.60)	(0.06)	(0.08)	(0.06)				(0.06)	(0.06)	(0.07)				(0.06)		(0.07)		(0.08)		.1297
OLS	-1.70	-0.15*	0.01	-0.02				0.18*	-0.10*	-0.00				-0.01		0.55*		-0.07		
	(1.33)	(0.06)	(0.06)	(0.05)				(0.05)	(0.05)	(0.05)				(0.05)		(0.05)		(0.05)		.3979
3. Income																				
2SLS	333.82	0.04	0.17*		-0.09	-0.09	-0.04									0.06			-0.31*	
	(198.32)	(0.07)	(0.07)		(0.07)	(0.08)	(0.06)									(0.06)			(0.09)	.1201
OLS	118.58	0.04	0.21*		0.01	0.08	-0.07									0.16*			-0.12*	
	(199.15)	(0.07)	(0.07)		(0.06)	(0.06)	(0.06)									(0.06)			(0.06)	.1127
4. Labour Force Participation																				
2SLS	2.08*	-0.03	0.69		-0.21*	0.15		-0.70*		-0.35*			0.86*	-0.06	-0.47*	0.97*		-1.51*		
	(0.28)	(0.07)	(0.22)		(0.06)	(0.13)		(0.20)		(0.14)			(0.28)	(0.08)	(0.14)	(0.29)		(0.44)		.1615
OLS	0.51	0.01	-0.02		-0.16*	-0.21*		-0.10		0.07			-0.06	0.14*	-0.13	0.18*		-0.09		
	(0.28)	(0.07)	(0.07)		(0.06)	(0.06)		(0.07)		(0.06)			(0.06)	(0.06)	(0.07)	(0.07)		(0.06)		.1478

Figures in parentheses=standard error.
*=Significant at the .05 level.
+2SLS=two-stage least squares.
++OLS=ordinary least squares.

TABLE II

STRUCTURAL EQUATION FOR LIVE BIRTHS OF COUPLES, WIFE AGE 35-49, WHO WANT NO MORE CHILDREN : ALL BANGLADESH, 1968/69 (N=265)

Variables	2SLS Estimate	OLS Estimate
I	25.11	3.88
EF	0.25	0.13*
EM	—0.66	—0.06
H	0.10	0.10*
L	0.08	—0.17*
AF	—0.23	—0.03
A	0.58*	—0.03
N	0.20	0.06
EC	—0.53	0.30*
F	0.03	0.01
AD	0.75*	—0.11*
U	0.38*	0.03
$\hat{D}$	1.00*	0.56
$\hat{Y}$	1.83*	0.13
$\hat{P}$	0.57	0.01

*Significant at the .05 level.

concentrating on the two-stage least squares (2SLS) estimates. If we recall our discussion of specification of the model, we see that H, L and AD were included as supplements to the income variable Y. If they do represent the same theoretical concept then their coefficients should probably have the same expected sign. The coefficient of Y is positive and significant. It seems that if current income is a proxy for long-term income as we hypothesized, then a general increase in economic well-being in Bangladesh leads to an increase in completed family size. This is reasonable outcome that probably reflects more than a pure income effect considering the low level of nutritional status in the country [3]. Unfortunately, this picture does not hold true for H, L and AD. The coefficients for H and L are not significant and that for AD turns out to be negative and significant. We should be careful, however, before drawing conclusions. It is possible that house and land ownership are proxies for socioeconomic dimensions other than income status especially since they do not incorporate the value of the equity. The negative coefficient of last year's income adequacy on the other hand is a plausible outcome consistent with a negative Y coefficient—large size families are more likely to have short-run economic pressures *ceteris paribus*.

We now move to the effect of education and female work on fertility. Neither male nor female education has a significant effect. Notice, however that the effect of a female education is positive for the ordinary least squares (OLS) estimate.

The same is true for female labour force participation. The idea that education is measuring taste effects rather than the cost of time is one reason for such findings—a threshold of education level (and quality) may need to be reached before a significant change of taste can materialize. Another price variable is child education EC. It has the expected negative sign but is not significant. Notice, however, the change in sign and significance from the OLS estimate.

Let us now consider the effect of other variables. Women in urban areas (U) tend to have more live births as do those who marry late (A). These findings do not lend themselves to easy interpretation. It is possible that women who marry late attempt to "make up" by having more children, i.e., not attempting to limit their family size until late or after "over-shooting" their desired number. But these are only conjectures. One of the variables formalizing household technology is child death. The coefficient for D is positive and significant. Women who experience more child deaths tend to have a larger number of live births, indicating the possibility of a replacement effect. None of the coefficients for the remaining variables in the fertility equation turn out to be significant. The reader should examine the remaining equations for income, mortality and female work. Some highlights of significant coefficients are the negative coefficient for female labour force participation (P) and the positive sign for male education (EM) in the income equation; the negative coefficient for female education in the mortality equation; and the negative and significant coefficient of Y, YC,N, AF and H in the female labour force participation equation, indicating a negative relation between economic and social status and female labour force participation for Bangladesh as a whole in 1968/69. We must emphasize, however, the shortcomings of our variables, some of which are inherently short-run indicators, in explaining completed family size—an inherently long-run decision. Now, we turn to our analysis of the desires for additional children.

VI. THE MODEL FOR DEMAND FOR ADDITIONAL CHILDREN

To develop the model we introduce some new notation in addition to that developed earlier.

AC : Dummy variable which takes the value 1 if the respondent wanted any more children and zero otherwise.

$\overline{P}$: Dummy variable which takes the value 1 if the respondent has "worked at anything other than housekeeping during the past week" or is "looking for work" and zero otherwise.

$\overline{EC}$: This variable can be better described if we mention the corresponding questions that were asked. It was first inquired as to whether the wife

thought it "necessary now-a-days to educate children". Those that answered yes were further asked as to how much education was necessary for girls. Out of these answers we constructed the dummy variable as follows :

=0 if the answer to the first question was no or the answer to the second question was less than three grades.
=1 otherwise.

B : Number of living boys.

G : Number of living girls.

U1 : Dummy variable which takes the value 1 if the respondent is living in an urban area of less than 100,000 people and zero otherwise.

U2 : Dummy variable which takes the value 1 if the respondent is living in an urban area of equal to or more than 100,000 people and zero otherwise.

R : Dummy variable which takes the value 1 if the respondent is living in a rural area and zero otherwise.

Also note that U1, U2 and R sum to 1 for each observation.

Model Specification

Our model relies heavily on previous work by Khan and Sirageldin [14]. It can be compactly specified as

$$AC = f(Y, H, L, AD, \overline{P}, \overline{EC}, AF, AM, A, D, B, G, EM, EF, T, F, U1, U2, R).$$

To begin with, note that the variable AC, a measure of the demand for additional children, does not distinguish between respondents who want only one additional child and those who want more. Further, it has nothing to say about spacing of the expected children.

We explain the analysis of demand for additional children with the theoretical scheme of the previous section. The same considerations which were relevant in the specification of the equation for births, (equation 1), are relevant here. It is only hoped that they again in credence for the absence of longitudinal data is no longer as severe a restriction.

Note, however, the difference between the variables P and $\overline{P}$ on the one hand and EC and $\overline{EC}$ on the other. The attendance of any children at school is much less relevant than some measure of the expectation of the costs of education. Also,

whether the wife is currently looking for work is a more relevant consideration in her planning to have additional children than is her ever having been a part of the labour force.

Finally, note the introduction of the variable B and G. These are included to measure son preference and as such should be seen as variables reflecting differences in the utility function U (.).

Estimation Technique

It is now well known that ordinary least squares estimation of the above model is inappropriate, not only because of problems associated with heteroskedasticity but also because there is nothing to constrain the dependent variable to the unit interval [9, p. 249; 30]. Experimentation with alternative functional forms is an active research area [11, pp. 72-93; 19]. In this paper we employ a technique used as early as 1955 by Tobin, the probit estimation technique.

For a thorough discussion of standard probit analysis, the reader is referred to Tobin [8], Finney [9] or Goldberger [31]. For attempts at extension to a simultaneous equation framework see Maller [17]. For us it will suffice to note that the probit model implies that the 'probability of success', (in our case the probability of wanting to have more children), can be written as

$$E(y/x)=P(x)=\frac{1}{\sqrt{2\pi}}\int_{-\infty}^{x'\beta}\exp\left(\frac{-u^2}{2}\right)=F(x'\beta)$$

where y is the binary dependent variable, x a vector of explanatory variables, β a vector of parameters to be estimated and F (.) the cumulative normal distribution function. For a technical note on the probit technique see Appendix. It should be noted however, that $\frac{\delta P}{\delta x_1}$, the effect of a unit change on an explanatory variable on the probability of success, depends on the particular value of the vector of explanatory variables.

More formally,

$$\frac{\delta P}{\delta x_1}=\frac{\delta F(x'\beta)}{\delta x_1}=F'(x'\beta).\beta_1$$

where $F'(x'\beta)=f(x'\beta)$, the density of the standard normal distribution function. Thus the maximum value of $\frac{\delta P}{\delta x_1}$ will occur where $f(x'\beta)$ attains its maximum, i.e., at 0. Thus Max $\frac{\delta P}{\delta x_1}=f(0).\beta_1=\frac{1}{\sqrt{2\pi}}\beta_1$.

Results for the Demand for Children

The results for the probit model are laid out in Table III. Focus first on equations 1 and 2. These were estimated for our initial sample of 897 Bangladesh women aged less than 40 years for whom we had information on current income. Equation 1 is an estimate of the complete model as specified in the previous section. Only six out of the 19 variables were significant at the five per cent level—namely number of living boys and girls B and G, child death D, rural-urban residence R and U_2, and aspirations for girl's education $\overline{EC}$. None of the

TABLE III

STRUCTURAL EQUATIONS FOR THE DEMAND FOR ADDITIONAL CHILDREN, WOMEN AGED LESS THAN 40 YEARS, ALL BANGLADESH, 1968/69

Variables	Equation 1		Equation 2		Equation 3	
	Estimates	t-stat.	Estimates	t-stat.	Estimates	t-stat.
H	-0.125	-0.716	-0.114	-0.650		
L	-0.005	-0.041	-0.010	-0.092		
AF	-0.016				-0.037	-6.069*
A	-0.002	-0.067				
B	-0.340	-7.286*	-0.389	-9.656*	-0.293	-10.895*
G	-0.179	-4.184*	-0.230	-6.173*	-0.189	-7.313*
$\overline{EC}$	0.235	2.213*	0.251	2.396*	0.294	5.031*
F	0.065	0.557				
EF	-0.054	-0.311	-0.019	-0.110		
AM	-0.011	-1.679				
AD	0.021	0.837	0.021	0.836	0.292	5.030*
EM	0.033	1.882	0.035	2.034*		
Y	-0.000	-1.158	-0.000	-1.316		
D	-0.138	-2.626*	-0.180	-3.636*	-0.021	-0.721
$\overline{F}$	0.148	0.619				
T	-0.000	-0.336				
U1	0.792	1.499	0.123	0.456	0.837	4.848*
U2	1.135	2.245*	0.460	2.090*	0.858	5.622*
R	1.193	2.449*	0,531	2.691*	0.985	7.643*
Number of observations	897		897		2658	
Mean of dependent variable	.365		.365		.385	
Chi-square statistic	252		242		761	
Degrees of freedom	18		12		8	

*Significant at the .05 level.

economic variables was significant. In our second run, we narrowed ourselves to only thirteen variables focusing, in addition to the significant variables, only on those we considered especially important in terms of our theoretical schema. The picture did not change much as regards the significant variables. Again none of the economic-related variables, with the exception of husband's education, was significant. It is evident that current income was not a very important factor in the demand for additional children. As such we no longer needed to be limited to the subsample of Bangladesh women for whom we had data on current income. We decided to disregard this limitation and estimate a reduced model including the most significant variables and adding the minimum necessary for an adequate specification of our theoretical schema. Thus, aside from the number of living sons and daughters, child death and urban-rural residence, which were significant in the first two runs, we added adequacy as an index of short-run relative economic position and age of wife and child death as proxies for household technology. The results are given in equation 3 for all 2658 women under 40 years old in our sample. All variables were significant except child death. The chi-square for the equation has the value 761. Let us examine closely the findings of equation 3.

The coefficient for adequacy is now significant and positive. As an index of short-run relative "well-offness" it increases women's desire for additional children. Recall that this is opposite to its effect on completed family size. As we mentioned earlier, these findings are not necessarily contradictory. Given a certain level of income, larger size families may feel economic pressures more often than smaller size families. The significance of adequacy reinforces the positive effect of Y on completed family size. Wife's age has the expected negative coefficient. However, child death lost its significance in this formulation. It was negative and significant in the previous runs. Rural women desire more children than urban residents. An iteresting finding, however, is that women who express higher aspirations for the education of girls seems to have greater desires for additional children. We do not have simple explanation for this finding. One possibility is that expressed desires for better child-quality, because of the way the question was asked, do not reflect a conscious calculation of the implied cost of education and accordingly there was no price effect. Finally, we examine the coefficients for the number of surviving boys and girls. Note that the coefficients for both the number of living boys and the number of living girls are negative and highly significant. However, the coefficient for boys is larger (26% larger) and more significant. This indicates the presence of sex preference in Bangladesh for women under 40 years. The intensity of sex preference (1.25 to 1.00), although significant at the five per cent level, is relatively weak when compared to our findings for Pakistani women whose ratio was 3 to 1 [15].

VII. SUMMARY AND CONCLUDING REMARKS

In this paper we examined two models of fertility behaviour in Bangladesh : one for completed family size and one for the demand for additional children. In this section we shall give an overview of the findings and end with some tentative policy conclusions. In terms of income and income-related variables the findings were not all similar. Current income is positively related to completed family size but has no effect on current desires for additional children. House and land ownership do not seem to have an effect either in the long-or the short-run model—possibly because of the way they were measured and the possibility that they are proxies for other variables as well. Adequacy on the other hand is significant and negative in the case of completed family size, while positive and significantly different from zero in the case of desires for additional children. These apparently contradictory findings are reconcilable. There is some empirical evidence that the effect of income on completed fertility is positive if adequate control is made for variables like education and urbanization [14]. There is no reason to believe, however, that current desires for additional children are necessarily related to income. It is more reasonable to expect that current desires are related more to recent experience with relative well-being. The role of adequacy in the two models can thus be justified.

Factors representing price effects seem to play no important role in the fertility decisions of Bangladesh women in 1968/69. The estimated coefficients for female employment and female education were not significant in the two models, nor was the cost of fertility control. These results could be a consequence of low average levels of these variables, e.g., below some threshold value required to induce change in fertility behaviour. Other findings relate to the age of marriage. Women who married at an older age tend to have more live births, a somewhat unexpected finding. However, there was no relationship between age at marriage and desire for additional children. In terms of place of residence, urban women seem to have more live births while rural residents seem to evidence greater desire for additional children. A possible explanation for these phenomena is that, given contraception, urban women have better nutrition and lactate less, thus having a higher probability of conception. We lack evidence to substantiate such an hypothesis, however. Finally, there seems to be an intensity for sex preference among Bangladesh women although not as strong as in other countries, e.g., Pakistan.

In summary, we can offer the following tentative conclusions.

1. Improvement in economic well-being seems to have a positive impact on fertility in Bangladesh.

2. The more adequate a Bangladesh couple consider its income the greater the probability of their wanting additional children.

3. Female education and work, given their level and type, seem to have no impact either on completed family size or the desire to have another child for Bangladesh women in 1968/69.

4. There are no clearcut results as regards the effect of family planning programmes on completed family size or on the desire for additional children.

5. The higher the number of sons and, to a lesser extent, daughters, the lower the probability of Bangladesh women wanting additional children.

In general these findings indicate that a serious effort to influence fertility in Bangladesh cannot accomplish its goal through a strategy relying mainly on individual motivation (see for example, the conclusion of Sirageldin, I., Monowar Hossain and Mead Cain [28]). There is evidently a need for some kind of a collective solution. Such a solution, however, might entail major structural change in society.

These conclusions, as in the case with any econometric study, are hampared by the limitation of the data base and by estimation problems (although we attempted to deal with some aspects of them). An important limitation is our use of desire or additional children to indicate short-run demand or sequential decisions. The stated desires may or may not materialize in actual behaviour. We plan to take our research a step further to examine sequential decisions using actual fertility outcome as the dependent variable. Our present data set did not allow such an analysis. We hope, however, that our attempt will stimulate further research based on better data sets using better techniques to help understand what determines fertility.

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Appendix

A NOTE ON THE PROBIT METHOD

Let $AC=\beta x+\mu$; μ error term (1)

be a relationship to be estimated where

AC= takes either the value 1 or zero,

X= vector of variables,

β= vector of coefficients associated with the variables X.

It is well known that the method of ordinary least squares has two principal disadvantages if used to estimate this relationship : there is a problem of heteroskedasticity leading to biased estimates and the dependent variable is not constrained to the unit interval [9, p. 249]. In view of these difficulties, alternative models have been developed. The probit model is one such alternative.

The probit model assumes that the dependent variable AC is generated by the following mechanism : (1) Nature computes for each observation, say the ith quantity X_i; (2) Nature generates a normally distributed variable Z with zero mean an unit variance; (3) If $X_i\beta \geqq Z$, AC_i is set equal to 1; otherwise AC_i is set equal to zero. Let f(Z) represent the density function of Z and F(Z) the corresponding cumulative distribution. We then have

$$Pr\{AC_i=1/X_i\beta\}=Pr\{Z\leqq X_i\beta\}=\int_{-\infty}^{X_i\beta} f(Z)dZ=F(X_i\beta) \qquad (2)$$

and $Pr\{AC_i=0/X_i\beta\}=1-F(X_i\beta)$ (3)

From (1) and (2) we see that the likelihood function can be written

$$L=\overset{\pi}{AC_{i=1}}\int_{-\infty}^{X_i\beta} f(Z)dZ \overset{\pi}{AC_{j=0}}(1-\int_{-\infty}^{X_j\beta} f(Z)dZ)$$

$$=\overset{\pi}{AC_{i=1}} F(X_i\beta) \overset{\pi}{AC_{j=0}}(1-F(X_j\beta)).$$

The above estimating technique is the maximum likelihood estimation of β's. We solved the resulting system of non-linear equations by an iterative Newton Rapheson procedure. The estimates obtained have the large sample properties of being Best Asymptotically Normal distributed with mean vector and variance covariance matrix equal to $(1/n)R^{-1}$ where n is the number of observations and

$$R=[r_{ij}] \quad \text{where} \quad r_{ij}=-\left[\frac{\delta^2 L}{\delta\beta_i\,\delta\beta_j}\right]$$

and L is the log of likelihood function evaluated at the point of maximum likelihood. Using this matrix, t-tests can be used to test simple regressor hypotheses. For more details see [30, sec. 8.5] and for application see Chambles and Satyanarayana (undated).

Rice Cultivation in Comilla Kotwali Thana : The Role of Cooperatives

by

QUAZI M.A. MALEK*

I. INTRODUCTION

Over the past few decades, the population growth rate in Bangladesh has been exceeding the growth rate of rice, the staple foodgrain. As a result the foodgrain deficit began to cumulate. Efforts have been made by the Government from time to time to close this deficit by initiating various "programmes". One such attempted "programme" is what is popularly known as the "Comilla Approach".

As early as 1959, an Academy for Rural Development (henceforth called BARD or the Academy) was set up at Kotbari, Comilla, to evolve a method for comprehensive rural development. The most important component of this approach was to focus attention on agriculture. Farmers were encouraged to group together into cooperatives and adopt improved methods of rice cultivation involving use of High Yielding Variety (HYV) seeds, chemical fertilizers, insecticides and mechanical irrigation.

The farmers' cooperatives of the village level are federated into the Agricultural Cooperatives Federation (ACF) at the centre (Thana). There are also some special types of cooperatives (like Rickshawpullers' Cooperatives, Small Traders' Cooperatives etc.) which are federated into a Special Cooperative Societies Federation (SCSF). The ACF and the SCSF are under the overall supervisory and advisory control of the Apex Organisation, the Thana Central Cooperative Association (TCCA). For the Kotwali Thana this organisation is called the KTCCA.

Obligations of the Farmers

Very little is demanded of the farmers. For becoming a member (of a cooperative) a farmer is required to buy a minimum of one share of Taka 10/-.

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Only operative farmers can become members. There is, however, no legal bar against a landless share-cropping farmer becoming a member. The second claim is that after becoming a member, he is required to save at least 50 paisas per week and hand it over to the manager of his cooperative in the weekly meetings. The members are expected to meet every week to discuss and solve their problems mutually. In these meetings the savings are also collected by the managers of the cooperatives. The model farmers and the manager are required to attend training lectures every week at the academy. They are supposed to disseminate this knowledge to the farmers in the weekly meetings of their cooperatives. The model farmer and the manager are paid a conveyance allowance by the Academy for attending these weekly lectures.

Cooperative Credit

Credit is provided only to the members against the security of mortgage of their land. The amount of loan sanctioned generally depends on the area of land offered as mortgage.[1]

All the members of a cooperative, who wish to take loan, make a joint application to the ACF and submit a production plan. Their needs are assessed by the ACF and the loan is almost invariably granted although the amount may be less than that applied for. The rate of interest on these loans is 15%. The Central Association gets 7%, 2% goes to the common fund of the village cooperative, 5% is kept as service charge. The remaining 1% is paid to the manager of the cooperative as his commission [5]. A landless member farmer can get loan upto a maximum of Taka 50/- provided the person, whose land he has leased, stands surety for him.[2]

HYV Seeds, Fertilizers, Insecticides and Sprayers

The Agricultural Development Corporation (ADC) looks after the distribution of HYV seeds, fertilizers, pesticides and sprayers. The ADC appointed dealers are posted at union level to sell seeds and fertilizers to all farmers (irrespective of members and non-members) at the prescribed (highly subsidized) rates. The insecticide is supposed to be distributed free and the sprayers are given on hire (at a very nominal charge) to anyone who would use it.

Irrigation

In Comilla Kotwali Thana, deep tube-wells are most widely used for lifting irrigation water. In 1970/71, 194 tubewells were used accounting for

[1]Calculated from data on 6 cooperatives, it was found that in the *boro* season of 1972, small farmers on an average took loans of Tk. 306/- per head, the medium farmers took Tk. 375/- and the large farmers took Tk. 494/-. The farmer groupings are defined later.

[2]For greater details see [6].

nearly 75% of the acres irrigated [1, p.69]. The remaining area was irrigated by low lift pumps and indigenous methods. Low lift pumps are few because surface water sources are poor. A cooperative group can procure tubewell or power pump from the ADC, through the KTCCA. The installation cost is borne by the ADC. The ADC also employs a full-time driver-cum-mechanic to run the tubewell (or pump). If any major repair is needed, the services of the Machine Station of the KTCCA is available at no cost to the farmers. The fuel cost and an yearly rental of only Taka 300/- are payable by the cooperative group as a whole. The fuel is also supplied from the ADC stores at the fixed rates.

Thus, we see that society at large substantially subsidizes the production costs of farmers who enlist themselves as members of cooperatives. So it is pertinent to ask if the members have been able to improve their lot much above the non-members and whether the use of the "Improved Methods" has increased, thereby increasing productivity. *A priori*, we would expect the members to have performed better than the non-members and also productivity to have increased significantly. It is also of interest to find what has happened to the productivity of the various size groups (by landholding) and whether there is significant productivity differential between them. In addition this paper makes a cursory evaluation of the trend of overall rice production in the Kotwali Thana as compared with the whole of Bangladesh. Finally some remarks are made on the attitude of the farmers within and outside cooperatives and its bearing on the working of this new experiment.

The paper is divided into four sections. Section II deals with data and methodology. Section III presents the analysis and results. Section IV presents the summary and conclusion.

II. DATA AND METHODOLOGY

This study uses the *boro* Crop Cutting Survey data for three years, 1966, 1969 and 1972. The reason for choosing *boro* is that it is grown in the winter season and largely depends on irrigation. And the cooperative activity is essentially centred around irrigation. So the effectiveness of the cooperatives in influencing rice production can be studied best by concentrating our attention on the *boro* season.

The crop cutting surveys are conducted by the Academy employing experienced enumerators. The sampling process is a two stage one. In the first stage a number of villages were chosen at random from among the 251 villages [4] of the thana. In the second stage a group of *boro* growing farmers were

chosen again at random. The size of each year's sample is 100 (farmers) and they include both members of cooperatives (members) and non-members. From among the *boro* growing plots of the farmers so chosen, one plot was selected at random. Then a rectangular $33' \times 16\frac{1}{2}'$ section ($\frac{1}{80}$th of an acre) of that plot, supposedly representative of the crop condition of the whole plot, was chosen for crop cutting. After the crop was cut, the yield was weighed and applying a certain drying factor, the dry yield was recorded. The relevant input use and production practice data for these plots were collected using a simple questionnaire.

For our purposes the respondents were divided and subdivided into various "Groups" and "Categories", which is discussed later. Table I gives a frequency breakdown of this division. Admittedly, the sample size is small, so that after breaking down into the several groups and categories, we ended up with small cell frequencies. The results, particularly where the group status is involved, should therefore, be judged very cautiously.

Data on clean rice production in Bangladesh was obtained partly from the Academy and partly from other published sources [3 ; 8].

Many of the questions were qualitative in nature and ways had to be found to quantify them. Quantification procedures are discussed below. The questionaires contained a section enlisting the different costs of rice production, but unfortunately this section was not filled in for the two earlier years, so it was not possible to find the changes in the net profitability of rice cultivation.

TABLE I

NUMBER OF RESPONDENTS IN VARIOUS GROUPS AND CATEGORIES

(M=Members, NM=Non-Members)

Year	Small Group		Medium Group		Large Group		Total of All Groups	
	M	NM	M	NM	M	NM	M	NM
1966	15	10	31	30	9	5	55	45
1969	16	10	42	12	14	6	72	28
1972	18	11	33	17	13	8	64	36

To understand the impact of cooperatives, an intercategory (members/non-members) comparison is made in respect of various input uses and one cultivation practice, namely, weeding. The other cultivation practice, line sowing, could not be taken into account because there was no information on it. Land preparation, it was assumed, was uniform among both "Categories" (members and

non-members) because the importance of preparing land well has been known to our farmers for centuries. The findings are divided into two parts, (i) comparison of all members of the cooperatives with all non-members, to see what has happened to the differences (in respect of input uses, weeding and resultant yields) between them over the years, and, ii) a comparison on the same basis, over the years, of "Small", "Medium" and "Large" farmer groups within and accross the member and non-member categories.

The farmer "Groups" are defined on the basis of owned holding of total farmland. Owned holding was taken rather than operational holding because it is less fluctuating and so more reflective of the actual economic status of the farmer. The average ownership of farmland, taking all the 300 farmers together (100 for each year), was found to be 2.32[3] acres. Then the "Small Group" was defined to include those farmers owning from 0 to 1.32 acres, "Medium Group" as those owning 1.33 to 3.33 acres and the "Large Group" as those owning more than 3.33 acres.

The question on irrigation and weeding were qualitative. Farmers were asked to rate their irrigation and weeding in terms of "Good", "Medium", "Bad" or "None".[4] Ordinal scores such as 3,2,1 and 0 respectively for "Good", "Medium", "Bad" and "None" were assigned. In this process, we are making an inter personal qualitative comparison, no doubt. But, the irrigation response of the *boro* crop is apparently so good that the possibility of large interpersonal differences in assessment is reduced. Further, the errors must tend to cancel out in the aggregate since there is no reason to expect a systematic bias in assessment.

The technique of analysis of variance with unequal cell frequencies is mainly used to analyse the data. To understand the overall impact of factors A and B ("Membership Status" and "Group Status", respectively) and their interaction on the various input uses and consequently on productivity differential, we employed the F-test. But, wherever the comparison of two means was concerned, we used the t-test. The results of both these types of tests are summarized in a master table in Appendix A (Table I). In addition the analysis of variance tables for the F-tests (Table II-VII), two tables for paddy yields with fertilizer, insecticide and seed variety control (Tables VIII and IX), and a table for the coefficients of variations of yields (Table X), are also placed in Appendix A. Only those tables, around which the analysis mainly revolves, find their place in the main text.

[3]The median holding is 2.125 acres. So obviously the distribution has a slight positive skew. The standard deviation is 1.68.

[4]"None" means no irrigation or weeding as the case may be.

III. RESULTS AND ANALYSIS

We find that in all the three years, 1966, 1969 and 1972, the members achieved a higher per acre *boro* yield than non-members (Table II).

TABLE II

DRY PADDY (*BORO*) YIELDS (IN MAUNDS) INTER-GROUP AND INTER-CATEGORY DIFFERENCES

(M=Members, NM=Non-Members)

Groups	Small Group			Medium Group			Large Group			All Groups' Total		
Years	M	NM	Total	M	NM	Total	M	NM	Total	M	NM	Total
1966	14.9	9.8	12.86	25.9	15.6	20.79	23.9	19.3	22.28	22.60	14.48	19.02
1969	48.8	40.9	45.78	46.6	41.2	45.36	46.3	25.5	40.09	47.01	37.76	44.42
1972	41.8	34.1	37.62	42.0	48.1	44.05	58.3	36.1	49.86	45.23	41.16	43.41

Note : 1 Maund=82.29 lbs.

In absolute terms, the member vs. non-member difference in *boro* yields increased in 1969 compared to 1966 and declined greatly in 1972. But in terms of F-tests we find that the level of significance of the differences have reduced over the years (Appendix A, Table II). However, for the year 1972, the interaction effect is significant which means the factors A and B are not independent and hence it is not clear how we should interpret the singnificance of the F ratio. So we applied t-test and found that the overall member vs.non-member difference was significant at even less than 1% level in 1966. In 1969 the difference was significant only at 5% level while in 1972 even at 20% level it was insignificant.[5] This suggests that the technology involved in the "Improved Methods" became more and more widespread among all farmer groups as the cooperative activity matured (Table V). We calculated the coefficient of variation of yields to test this point further and found that for both categories of farmers the coefficient came down over the years (Appendix A, Table X) indicating that the uncertainty relating to the new methods reduced, as would be expected. It can also be seen that the coefficient was higher for non-members in all years. However, the difference between the member and non-member coefficients increased from 1966 to 1969 and then declined from 1969 to 1972. This brings out the point that when in 1966 the new technology ("Improved Methods") was just being introduced, the member vs. non-member differences were not very marked. By 1969 when the cooperatives

[5]The t values are 3.83, 2.09 and 1.24 for 1966, 1969 and 1972 respectively. The degrees of freedom are 98.

had functioned for a number of years and the effort to introduce the "Improved Methods" was several years old, the member vs. non-member differences had grown. But by 1972, the facilities and knowledge needed for the adoption of the "Improved Methods" had spread and so, little member non-member differences remained.

To understand the role of groups, we compare the yields of different groups in different years. In 1966 and 1972 there is a clear pattern—the larger size group has the higher yield rate. But in 1969 the picture can be said to be the reverse. In this year the small and medium groups get, practically, an equal yield but the large group gets a smaller yield. However, not all the differences are significant (at .05 level; henceforth all references to significance means significance at the .05 level, unless otherwise mentioned). In 1966 the small-medium and small-large differences were significant while the medium-large difference was not. In 1969 none of the inter group differences were significant. But in 1972 the trend was broken by the small-large difference becoming significant. If we now try to break up each group into their member vs. non-member categories and look at the yields, the picture becomes further confused. The trends across groups (i.e., in order of size group) are different in different years for both member and non-members. The trends over the years are also different for different size groups within any category. Again, if we compare the time trends of members with non-members the pattern is not the same for all size groups. Only in the large group both members and non-members have maintained a similar trend of increasing yields over the years. Even if we leave out of consideration the results of comparisons which are insignificant, we do not get any clear picture from the results (Appendix A, Table I).

The analysis of variance table for yields (Appendix A, Table II) confirm these findings. In all years the membership status turns out to be a significant factor. However, in 1972 this conclusion faces the difficulty of interpretation as mentioned earlier. The t-test shows that the factor has become insignificant. As for the group status, in 1966 it was significant and thereafter it was not. This needs an explanation which can be obtained from an analysis of the various input uses and some other related criteria.

(i) Land under *boro* : We consider the proportion of one's land one puts under *boro* as a criterion. Historically, *boro* was an unimportant crop in the Kotwali Thana. The Comilla Approach emphasized this crop because the relevant season was free from flood hazards. To what extent the farmers accepted this idea can be guaged from the above criterion. This is not a factor that directly matters for the per acre yield, but it is a factor which indicates the extent of the progressive drive in the farmers.

The analysis of variance done with this criterion shows that membership has been an important factor in 1966 and 1969 but became unimportant (insignificant) in 1972 (Appendix A, Table III). This is in direct correspondence with the results of the yield analysis.

But as regards group status, it was an important factor in all the three years although in yield analysis group status became unimportant in 1969 and 1972. This finding is not unexpected. The non-members found, from the trials of the members, that *boro* was a safe crop and they also began to devote increasing proportions of their land to *boro*. The total picture is given in the table below.

TABLE III

LAND UNDER BORO : BY GROUPS AND CATEGORIES

(EXPRESSED AS A PERCENTAGE OF FARMLAND OWNED)

Group	Small Group			Medium Group			Large Group			All Groups		Total
Years	M	NM	Total	M	NM	Total	M	NM	Total	M	NM	Total
1966	71.8	64.8	69.0	33.3	22.9	28.0	46.8	22.4	36.8	41.6	25.8	34.2
1969	165.2	91.5	143.0	68.9	32.3	60.6	54.2	27.0	47.5	68.1	34.0	60.4
1972	155.3	104.5	133.1	87.7	30.8	71.4	41.9	27.7	36.8	62.6	40.0	59.8

As for the group status coming out significant, the obvious reason is that the smaller groups, being economically pressed, appreciate better the need for a supplementing crop (*boro* supplementing *aman* and *aus*). So they find it advantageous to lease land from the larger groups for the sake of raising a *boro* crop.

(ii) Irrigation : Pump and tubewell irrigation is the next most important factor as far as the similarity of the significance pattern with that of yield is concerned (Compare the first two rows under Cr.I and Cr.III in Appendix A, Table I). Here too the membership status is an important factor in all years, but group status is not (Appendix A, Table IV). In each year, in each group members enjoy more pump and tubewell water than non-members ; which is natural since members are legally entitled to this water while non-members are not. The latter got water only when it was surplus (or spareable). To meet the rest of their water needs, the non-members use the traditional (indigenous) methods of irrigation. We find that in case of overall irrigation (i.e., pump and tubewell coupled with the traditional method) the member vs. non-member differences become insignificant in 1966 and 1972. In 1969 the pump and tubewell irrigation situation was so good that although non-members got a substantial amount of this water,

the members got much more and so their differences were significant. A very detailed picture of the irrigation performance is given in Table IV below.

TABLE IV

AVERAGE QUALITY OF IRRIGATION (MEASURED IN POINTS) **BY GROUPS AND CATEGORIES**

Method of Irrigation	Years	Small Group		Medium Group		Large Group		All Groups' Total	
		M	NM	M	NM	M	NM	M	NM
Pumps and Tubewells (A)	1966	1.0	0.2	1.0	0.3	1.0	0.4	1.00	0.27
	1969	2.3	1.5	2.2	1.8	1.9	1.5	2.19	1.61
	1972	1.7	1.4	1.8	0.7	1.8	0.3	1.78	0.81
Traditional Method (B)	1966	0.3	0.7	0.2	1.1	0.0	0.8	0.18	1.00
	1969	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.14
	1972	0.0	0.0	0.1	0.8	0.1	1.5	0.10	0.69
Total of (A+B)	1966	1.3	0.9	1.2	1.4	1.0	1.2	1.18	1.27
	1969	2.3	1.9	2.2	1.8	1.9	1.5	2.19	1.75
	1972	1.7	1.4	1.9	1.5	1.9	1.8	1.88	1.50

Note : 0- No irrigation; 1- Bad irrigation; 2-Medium irrigation; 3- Good irrigation.

So we do not get a close correspondence between the significance patterns of yields and overall irrigation although between yield and mechanical irrigation there is a good correspondence. And, to account for yields we should naturally consider the overall irrigation and not merely mechanical irrigation.

(iii) Fertilizer : The yield performance also corresponds to some extent with the performance regarding fertilizer use. In its use membership status was immaterial in 1966 but not so in 1969 and 1972. The group status was never an important factor (Appendix A, Table I).

(iv) HYV Seed Use: Both irrigation and fertilizer use cannot, in fact, be understood without reference to the adoption rates of the HYV. Table V tells us the pattern of HYV use in various years by various groups and categories. In 1966, there was very little use of the HYV. So there was no significant member non-member difference in the use of overall irrigation and fertilizer. Yet there was a significant difference in their yields, which indicates that either (a) some other factors were responsible, or, (b) although differences with respect to each factor were insignificant, their sum total could yet produce

TABLE V

PERCENTAGE OF RESPONDENTS USING HYV BY GROUPS AND CATEGORIES

Groups	Small Group			Medium Group			Large Group			All Groups' Total		
Years	M	NM	Total	M	NM	Total	M	NM	Total	M	NM	Total
1966	0	0	0	9.7	0	4.9	0	0	0	5.5	0	3.0
1969	93.8	70.0	84.6	85.7	75.0	83.3	92.8	33.3	75.0	88.9	64.3	82.0
1972	94.4	100.0	96.6	97.0	100.0	98.0	100.0	75.0	90.5	96.9	94.4	96.0

a significant yield difference. In 1969, the significant yield differences are caused by different HYV adoption rates. Among members 88.9% used HYV while the corresponding figure for non-members was 64.3%. As a result there were significant differences in irrigation and fertilizer use. In 1972 there was a significant difference in fertilizer use and yet there was no difference in yields. But as can be seen from the analysis of variance table for fertilizer use (Appendix A, Table V), the level of significance came down very greatly when compared to 1969.

As for the importance of the group status, it appears that it is not an important factor explaining differences in the rate of adoption. All groups show an increasing adoption rate over the years; the large group being slightly slower (but it is not significant). If however, we look at the member vs. non-member differences in each group, we find that the largest differences existed in the large group. It is also noticed that, as in the case of most other factors considered, member vs. non-member differences were high in 1969 but tended to reduce by 1972.

(v) Insecticide Use : The following table gives us a complete picture of the use of insecticides. There are no significant group differences, but within each group and in the aggregate of all groups, there are significant member vs.

TABLE VI

PERCENTAGE OF RESPONDENTS USING HYV BY GROUPS AND CATEGORIES

Groups	Small Group			Medium Group			Large Group			All Groups' Total		
Years	M	NM	Total	M	NM	Total	M	NM	Total	M	NM	Total
1966	33	20	28	55	13	34	56	20	43	50	15	34
1969	100	80	92	93	67	87	86	50	75	93	58	86
1972	100	73	90	100	65	88	100	38	76	100	61	86

non-member differences in all years. The spread of the use has increased over the years among both categories but the differences have remained significant. This factor, therefore, becomes relevant in explaining the yield differences.

(vi) Other Factors : With respect to two other factors, namely, use of organic manure and weeding, there were never any significant inter-category or inter-group differences (Appendix A, Tables VI and VII). However, we do note that the performance of both members and non-members in these respects improved very much over the years (Tables VII and VIII).

TABLE VII

MANURE USE (MAUNDS PER ACRE)

	1966	1969	1972
Members	57.96	76.65	85.95
Non-Members	41.55	65.82	82.08

Note: 1 Maund=82.29 lbs.

TABLE VIII

AVERAGE QUALITY OF WEEDING (MEASURED IN POINTS)

	1966	1969	1972
Members	1.05	1.32	2.49
Non-Members	0.98	1.43	2.50

Note : 0- No weeding; 1-Bad Weeding; 2- Medium Weeding; 3- Good Weeding.

Thus, we find that there are no significant member vs. non-member differences in manure use, weeding and overall irrigation although there are differences if we consider only the irrigation provided by the cooperatives. But for yield it is the total irrigation that counts and we find no difference to speak of in that. The only important differences are in fertilizer use and insecticide use. This, tends to indicate that cooperatives have affected yields insofar as they have been able to affect these two factors. But these inputs are sold and given free respectively at the ADC stores. Yet when we find differences in respect of these two factors it strongly suggests that organization of the members into a group is a very important 'factor'. By being a manager of the cooperative, he is probably able to wield an influence. If there is scarcity of fertilizers and insecticides, probably the manager gets a preference, and the corresponding benefit, it seems from our data, also trickle down to the members. We carried out further tests in

this regard. Controlling for fertilizer we found that member vs. non-member yield differences were insignificant for the HYV, but just barely significant for the local variety. When insecticide is controlled, there is no such significant difference for either varieties (Appendix A, Tables VIII and IX). This

TABLE IX

MEAN LAND HOLDING BY GROUPS AND CATEGORIES (IN ACRES)

Farmer Categories		1966	1969	1972
Members	Small	.78	.71	.65
	Medium	2.19	2.09	2.19
	Large	4.25	5.65	5.47
	Total	2.14	2.48	2.40
Non-Members	Small	.78	.88	.73
	Medium	2.32	2.17	2.16
	Large	5.44	4.33	4.98
	Total	2.33	2.03	2.33

probably means that in the case of HYV non-members are more particular to keep pace with the members.

So, when we control for the effects of fertilizer and insecticide, we find that there is no difference which can be attributed to the sole factor of the membership status (i.e., whether one is a member or non-member). When a member or a non-member uses the same kinds and quantities of inputs, they come up with the same amounts of yield. Thus, now, it can be said more confidently that in our sample differences between the yields of members and non-members arise essentially from the differences in use of fertilizer and insecticides. There is nothing inherently different between a member and a non-member. In this respect we looked at the land holding pattern of the sample. One may tend to think that some inherent characteristics may be hidden in the size of the holding, which by and large reflects the economic status of the farmer. But we found that even in the land holding pattern there were no significant differences either group-wise or in the aggregate (Table IX). There is no difference between members and non-members as far as eligibility for getting fertilizer and insecticides from the ADC store is concerned. But *de facto* there has turned out to be a difference. The only legal difference is found in respect of credit and irrigation water. In respect of irrigation where the non-members fall short of the members, they make up by using the indigenous method. Thus, it appears that it is only in respect of credit where non-members are unable to find an adequate alternative

source and that probably explains some part of the difference that exists in fertilizer use. But the importance of organisation also is certainly strong. This is particularly supported in case of insecticide because it is provided free.

As for the group status, either in the aggregate or within any category, it was found that there is no definite trend at all. So we can, probably, say that cooperatives have not led to any definite pattern of group differentiation.

Rice Production in Comilla Kotwali Thana

From the operation of cooperatives in this thana the members have been able to increase their rice production quite substantially, as we have seen. We have also seen that after 1969 the "spread effect" has so worked as to reduce the member vs. non-member yield gap. The average productivity has increased (for both members and non-members) between 1966 and 1972. But if we look at the yearly rice production trend of the thana as a whole vis-a-vis that of whole Bangladesh we do not find any significant difference between the two. Over the 1960-70 range the rice production of whole Bangladesh grew at an exponential rate of 2.3% while that for Comilla Kotwali Thana grew at 2.4% (Appendix B). We found it reasonable to leave out 1970/71 and 1971/72 because the former was disturbed by the war of liberation and the latter by the diesel and spare parts crisis (affecting irrigation). If we include the production figures of these two years we get a bad fit of the exponential trend to the data, in both the series (i.e., the series for Bangladesh as a whole and that for the Kotwali Thana).

So, it seems that although cooperatives have lent strong support to the expansion of the *boro* crop in the thana, its impact in overall rice production has not been much different from that of the whole of Bangladesh. Using BARD data [1, p. 78] we find that *boro* accounted for 34.17%, 31.44% and 54.94% of total production of paddy in the years 1970/71, 1971/72 and 1972/73, respectively.[6] The corresponding figures for Bangladesh, are 19.95% and 17.78% respectively for 1970/71 and 1971/72 [2, p. 31]. If these figures are any indication, it appears that relative to the whole of Bangladesh, Comilla Kotwali Thana has been adopting *boro* at a higher speed but only at the cost of *aus* and *aman*. Table X verifies this.

Attitude of Members

By cooperatives, one usually understands an organization involving mutual give and take. But the Comilla cooperatives do not give the appearance of any such cooperation among the members. Each person becomes a member

[6] In 1971/72 the *aus* crop survey was not made due to the war situation. So production for that year was assumed to be 10% less than that of 1970/71.

TABLE X

DRY PADDY PRODUCTION IN COMILLA KOTWALI THANA (IN MAUNDS)

Year	Aus	Aman	Boro	Total
1970/71	377123 (17776)	814448 (32032)	618539 (15181)	1772397
1971/72	339410* (13522)	777412 (28331)	512246 (13288)	1629068
1972/73	265965 (10877)	321529 (18796)	716582 (15763)	1304076

*The figure was not available. It was assumed that it was 90% of the 1970/71 figure. The acreage is obtained by dividing the production figure by the average yield of 25.1 maunds.

Source : [1, p.28].

Note ; Figures in brackets are acres.

strictly with a view to getting the benefits of credit, irrigation etc., and thereby consolidate his individual economic position. The author got these impressions by talking to a large number of farmers of the thana. The members were absolutely unwilling to consider a rental payment of more than Tk.300/- per year for a tube-well even when they were brought to understand that Tk. 300/- is a ridiculously low rental and that they should be ready to bear the total cost of all the facilities that are provided to them by the society at large. They opined that there would be much discontent if they were asked to pay more for the irrigation water, fertilizer etc. It has also become a practice with the members to repay the last season's loans by taking a current loan. They should have been expected to become self financing by now so far as their credit needs were concerned. But it has not happened. The cumulative loan figures to date far exceed the cumulative savings and shares figures.[7] There is also evidence that with the passage of time the indebtedness of the cooperative societies have rather increased (Table XI).

Contrary to normal expectation that may be on per capita basis the loans have reduced, it "seems to increase with the age of the society" [6, p. 24].

The sense of belonging to a group was envisaged to be brought about by requiring the members to meet once a week to discuss and mutually solve their problems. The initial enthusiasm of these meetings has died down. From a sample

[7]Till 1968/69 the cumulative share capital plus savings of the ACF was Tk.23,52,711 while the cumulative loan issued upto then was Tk. 1,15,07,848 [9,pp. 21-22; 5].

TABLE XI

INDEBTEDNESS BY AGE OF SOCIETY (AS OF JUNE 1969)

Age	Outstanding Loan or Amount (Rupees)
2 - 4	5,154
4 - 6	14,225
8 - 6	38,807
8 - 10	49,337

of 30 village cooperative societies,12 were found to be inactive in respect of weekly meetings, savings collection, loan repayment, etc. The extent of inactivity varied from 10% to 60% meaning 10% to 60% of the member's were inactive [4,pp.-45,82]. During the *boro* season, this author found out, these meetings mostly work to settle disputes arising out of anomalies (favouratism, dishonesty) in the distribution of irrigation water. Some non-members told the author that they are discouraged to become members when they see this endless bickering among the members. No spirit of accommodation has developed. This has discouraged a part of the non-members from becoming members and thereby extend the benefits of the cooperatives among a greater clientele. Also, there is a built in anomaly to make the cooperatives a vehicle of income inequality. For all practical purposes, the landless are debarred from becoming members of cooperatives. In Kotwali Thana 17% of the families appear to be landless [7]. The landless and the land-poor farmers have no incentive to join the cooperatives because they are well aware that facilities available from the cooperatives are quite proportional to the size of landholding. Even among members, those who have little land, understand quite keenly that in terms of shares to be purchased and weekly savings, their role in forming a cooperative is as much as that of a land-rich member. But when it comes to getting the benefits, the land-rich stand to gain much more per unit of sacrifice (or obligation). In the case of cooperative credit, it was found that small farmers (members with 0-1 acre of owned farmland) got on a per capita basis only Tk. 85/- (as of June 1969), medium farmers (1-3 acres) got Tk. 1391/- and large farmers (above 3 acres) got Tk. 3112/- [4, p. 27]. In our sample we find that in 1966 there were no landless members. In 1969 and 1972 there were only 2. The study by Solaiman [11] found that in 1973, 30 out of 285 families in cooperatives had no land while 47 out of 162 families said that they could not become members because they had no land. Another 8 out of 162 could not join cooperative because they had very little land, an amount which they thought could not ensure any meaningful return. Thus, the

differential cost-benefit ratios for the different land owning sizes is a strong weakness of the cooperatives of the Comilla type. It is a built-in constraint against expansion of the cooperatives.

IV. SUMMARY AND CONCLUSION

The overall pattern that seems to emerge from the above exercise is that, in 1966 (early stage of cooperative activity in *boro* cultivation) the members and non-members were nearly at the same position in terms of input use and weeding practice. But by 1969, when the cooperatives had become reasonably accepted, the member vs. non-member differences reached a peak in these respects. Then as the educative effect of cooperatives began to manifest itself through higher yields, the non-members came close to the members in most respects. Differences reduced to insignificance in all but fertilizer and insecticide use. And these two led to the significant yield difference.

However, since, cooperative activity is limited to the *boro* rice cultivation in the main, it has had little impact on the whole year's production of rice in the thana. The overall growth rate of the yearly rice production for this thana is not at all significantly different from that of Bangladesh as a whole over the decade of the sixties. It is seen that over 1970-73 the *boro* acreage has expanded in Kotwali Thana at the cost of *aman* and *aus* acreage. The thana is a surplus rice area. This could be a reason which accounts for the negligence in *aman* and *aus* —the switch towards *boro* being justified by the fact that *boro* is a more sure crop since it is produced under greater control. *Aus* and *aman* are subject to risks of flood and the monsoons. So in fine, we do not seem to have any evidence to say that the cooperatives have achieved spectacular success in the field of rice production. Apart from this the nature and work of the cooperatives is such that it encourages an attitude of dependency among members and a spirit of accommodation has not yet developed. The landless and landpoor feel quite alienated. So, unless the structure of the cooperatives are so changed as to include this substantial section of the population the fruits of the cooperative effort can neither be deep-rooted nor widespread.

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Appendix A

TABLE I

SIGNIFICANCE—INSIGNIFICANCE TABLE

(Testing at .05 error level)

M—Members
NM—Non Members

S—Significant
I—Insignificant

	Criteria (Cr.) Number	Cr. I			Cr. II			Cr. III			Cr. IV			Cr. V			Cr. VI			Cr. VII		
	Criteria Head	Paddy Yields			Quality of Overall Irrigation			Quality of only Pump and Tubewell Irrigation			Fertilizer Use			Manure Use			Quality of Weeding			Land under *Boro*		
	Years	1966	1969	1972	1966	1969	1972	1966	1969	1972	1966	1969	1972	1966	1969	1972	1966	1969	1972	1966	1969	1972
Overall Factor Importance	A : Membership Status	S	S	S	I	S	I	S	S	S	I	S	S	I	I	I	I	I	I	S	S	I
	B : Group Status	S	I	I	I	I	S	I	I	I	I	I	I	I	I	I	I	I	I	S	S	S
	AB: Interaction	I	I	S	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
M-NM Difference Among Groups	Small Group	I	I	I	I	I	I	S	S	I	I	S	I	I	I	I	I	I	I	I	S	I
	Medium	S	I	I	I	I	I	S	I	S	I	S	S	I	I	I	I	I	S	I	I	I
	Large Group	I	S	S	I	I	I	I	I	S	I	I	I	I	I	I	I	I	I	I	I	I
Group Difference Within M	Small - Medium	S	I	I	I	I	I	I	I	I	I	I	I	I	I	I	S	I	I	S	S	S
	Small - Large	I	I	S	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	S	S	S
	Medium - Large	I	I	S	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	S
Group Difference Within NM	Small - Medium	I	I	S	I	I	I	I	I	S	I	I	I	I	I	I	I	I	I	S	I	I
	Small - Large	I	I	I	I	I	I	I	I	S	I	I	I	I	I	I	I	I	I	S	I	I
	Medium- Large	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I

Note : The first three rows are the results of 'F' tests and the rest are results of 't' tests.

TABLE II

ANALYSIS OF VARIANCE TABLE PADDY YIELDS

Years	1966				1969				1972			
Factors	Total S.S.	D.F.	Mean S.S.	F	Total S.S.	D.F.	Mean S.S.	F	Total S.S.	D.F.	Mean S.S.	F
A : Membership Status	737	1	737	6.689S	2275	1	2275	5.752S	1286	1	1286	5.221S
B : Group Status	1155	2	578	5.243S	1134	2	267	1.433I	1291	2	646	2.621I
AB : Joint Effect	111	2	55	.498I	812	2	406	1.025I	2735	2	1367	5.550S
Within Cell	10466	94	111		37163	94	396		23156	94	246	

Note : 1. S - Significant at .05 level.
2. I - Insignificant at .05 level.
3. In each case the Joint Effect. AB is Insignificant. So the SS. for this has been pooled with the within cell S.S. for calculating the F's for A&B. This practice has been undertaken in all such cases that follow.
4. S.S.—Sum of Squares; D.F.—Degrees of Freedom.

TABLE III

ANALYSIS OF VARIANCE TABLE LAND UNDER BORO

Years	1966				1969				1972			
Factors	Total S.S.	D.F.	Mean S.S.	F	Total S.S.	D.F.	Mean S.S.	F	Total S.S.	D.F	Mea S.S.	F
A. Membership Status	3630.5	1	3630.5	4.18S	48326	1	48326	9.78S	44471	1	44471	2.61I
B : Group Status	18415.6	2	9207.8	10.60S	80218	2	40109	8.12S	224579	2	112290	6.58S
AB : Joint Effect	267.72	2	133.86	.155I	17313	2	8656.5	1.82I	22984	2	11492	.68I
Within Cell	81383	94	865.7		422444	89	4746.6		1512858	90	16810	

TABLE IV

ANALYSIS OF VARIANCE TABLES QUALITY OF OVERALL IRRIGATION

Years / Factors	1966 Total S.S.	D.F.	Mean S.S.	F	1969 Total S.S.	D.F.	Mean S.S.	F	1972 Total S.S.	D.F.	Mean S.S.	F
A : Membership Status	.0033	1	.0033	.0044I	3.432	1	3.432	4.432S	1.691	1	1.691	3.460I
B : Group Status	.6059	2	.3030	.4030I	1.872	2	.936	1.179I	6.540	2	3.270	6.692S
AB : Joint Sell	1.2163	2	.6082	.8089I	.0248	2	.0124	.0124I	.156	2	.078	.160I
Within Cell	70.6720	94	.7518		74.635	94	.794		45.931	94	.489	
QUALITY OF ONLY PUMP AND TUBEWELL IRRIGATION												
A : Membership Status	8.368	1	8.368	15.52S	5.729	1	5.729	6.593S	19.496	1	19.496	31.700S
B : Group Status	.114	2	.057	.1056I	.902	2	.451	.519I	3.072	2	1.536	2.532I
AB : Joint Effect	.117	2	.0585	.1085I	.531	2	.265	.305I	.420	2	.210	.341I
Within Cell	50.667	94	.539		81.679	94	.8689		57.811	94	.6150	

TABLE V

ANALYSIS OF VARIANCE TABLE FERTILIZER USE

Years / Factors	1966 Total S.S.	D.F.	Mean S.S.	F	1969 Total S.S.	D.F.	Mean S.S.	F	1972 Total S.S.	D.F.	Mean S.S.	F
A : Membership Status	44232	1	44232	3.094I	301097	1	301097	12.384S	94188	1	94188	6.775S
B : Group Status	42792	2	21396	1.497I	11388	2	5694	.234I	18884	2	9442	.679I
AB : Joint Effect	20322	2	10161	.722I	2127	2	1084	.043I	19652	2	9826	.702I
Within Cell	1323537	94	14080		2531951	94	24808		1314921	94	13988	

TABLE VI

ANALYSIS OF VARIANCE TABLE MANURE USE

Years / Factors	1966 Total S.S.	D.F.	Mean S.S.	F	1969 Total S.S.	D.F.	Mean S.S.	F	1972 Total S.S.	D.F.	Mean S.S.	F
A : Membership Status	3531	1	3531	1.254I	2269	1	2269	.659I	658	1	658	.224I
B : Group Status	5157	2	2579	.916I	1962	2	981	.285I	357	2	174	.059I
AB : Joint Effect	1444	2	722	.252I	4431	2	2216	.640I	1659	2	830	.278I
Within Cell	268861	94	2860		33510	94	3565		280256	94	2981	

TABLE VII

ANALYSIS OF VARIANCE TABLE QUALITY OF WEEDING

Years / Factors	1966 Total S.S.	D.F.	Mean S.S.	F	1969 Total S.S.	D.F.	Mean S.S.	F	1972 Total S.S.	D.F.	Mean S.S.	F
A : Mebership Status	.1346	1	.1346	3.570I	.000643	1	.000643	.0019I	.3867	1	.03867	.1112I
B : Group Status	.0839	2	.0420	1.114I	1.0294	1	.5147	.1561I	.18239	2	.09119	.2621I
AB : Joint Effect	.0309	2	.0155	.405I	.6586	2	.3293	.998I	.194228	2	.97114	2.9023I
Within Cell	3.5889	94	.0382		31.0048	94	.3298		31.45336	94	.3346	

TABLE VIII

MEAN HYV DRY PADDY YIELDS/ACRE WITH FERTILIZER AND INSECTICIDE CONTROL

	Fertilizer			Insecticide	
	0-100 Seers*/ Acre	01-250 Seers/ Acre	Above 250 Seers/ Acre	Use	Non-use
Members	46.12	44.97	50.11	49.21	
	(20)	(41)	(68)	(66)	
Non-Members	44.95	40.46	48.92	45.14	
	(21)	(18)	(13)	(34)	
		F=.67S		t=1.15I	

TABLE IX

MEAN LOCAL VARIETY DRY PADDY YIELD PER ACRE WITH FERTILIZER AND INSECTICIDE CONTROL

	Fertilizer			Insecticide	
	0-30 Seers*/ Acre	31-90 Seers/ Acre	Above 90 Seers/ Acre	Use	Non-use
Members	20.09	19.76	22.15	22.94	18.08
	(32)	(11)	(14)	(31)	(31)
Non-Members	12.87	14.57	22.8I	18.75	14.75
	(17)	(24)	(21)	(10)	(46)
		F=4.30S		F=3.054I	

Notes: 1. Figures in brackets are cell frequencies.
2. F is for factor A, the membership status.
3. I seer=2.06 lbs.

TABLE X

COEFFICIENTS OF VARIATIONS OF YIELDS

Year	Member	Non-Member
1966	.563	.675
1969	.391	.542
1972	.286	.398

Appendix B

TABLE I

RATE OF GROWTH OF RICE PRODUCTION IN COMILLA KOTWALI THANA : 1960/61 TO 1969/70

Years (t)	Clean Rice Production (Y) (maunds)
1960/61	9,27,900
1961/62	9,81,825
1962/63	10,08,075
1963/64	10,69,950
1964/65	10,40,100
1965/66	11,66,700
1966/67	10,71,375
1967/68	9,33,300
1968/69	11,02,500
1969/70	13,35,750

The above series is constructed from data on dry paddy production given in various PARD annual reports from 1960/61 to 1965/66. The remaining four years' data was also available from the Academy, through correspondence. Dry paddy was converted to clean rice by using the commonly used conversion factor of .75. The series gave an exponential growth rate (using the formula, $Y_t = Y_o\ e^{rt}$) of 2.4%. The Y_o and r were found significant at the .05 level.

For rice production figures for the whole of Bangladesh the unpublished data of the Bureau of Agricultural Statistics was taken from the year 1960/61 to

1969/70. The two years 1970-72 were discarded because they were disturbance years. We got the following figures.

TABLE II

Year	Production (in tons)
1960/61	95,19,400
1961/62	94,65,300
1962/63	87,29,590
1963/64	104,55,910
1964/65	103,34,125
1965/66	103,34,780
1966/67	94,24,145
1967/68	109,95,006
1968/69	111,64,790
1969/70	117,15,900

This series shows an exponential rate of growth of 2.3%.
Here also Y_o and r were found to be significant at .05 level.

An Analysis of Terms of Trade of Bangladesh, 1959/60 to 1974/75

by

SULTAN HAFEEZ RAHMAN*

I. INTRODUCTION

The terms of trade is a popular economic concept. The general public interest in the terms of trade, has been strengthened by the increasing conflict of economic interests between the more and less developed worlds. The terms of trade is an index of relative prices of exports and imports which is the major determinant of the international allocation of resources and consequently the global distribution of income, in a free trade situation. Generally the LDC's export raw materials and imports intermediate and finished products. Thus it is faced with a price disadvantage on account of lower international prices for raw materials relative to manufactured goods. The less developed world is therefore genuinely concerned about their external terms of trade.[1]

For many LDC's adverse terms of trade may not be an extremely serious problem, since the proportion of foreign trade in the GDP is not significant enough. Even though foreign trade is relatively less important for Bangladesh, the terms of trade is an important variable. Bangladesh has meagre resources at her command, as a result her import capacity is highly limited. The rate at which exports are exchanged for imports must improve, if Bangladesh is to increase its capacity to import from exports alone. Given an alarming balance of payments deficit, what happens to the terms of trade, becomes all the more important, if Bangladesh wants to reduce its reliance on foreign aid and loan. This paper attempts to analyse the movement of the terms of trade of Bangladesh over the period 1959/60 to 1974/75, specify the implications and identify the causes underlying the trend in the terms of trade. We have divided the period into two sub-periods. The first period covers the years 1959/60 to 1968/69 and the second period covers the years 1969/70 to 1974/75. Such separate treatment becomes necessary because of the emergence of Bangladesh in the latter period, in a completely different set of circumstances. Chaining the index for the two

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[1]By the terms of trade we will mean the commodity/net barter terms of trade unless otherwise mentioned.

periods would have reduced the credibility of the results. Section II presents sources of data and methodology. Section III contains an analysis of the movement of terms of trade. Implications of this movement of terms of trade are presented in Section IV. Probable causes of the trend in the terms of trade are discussed in Section V. The paper ends with a conclusion in Section VI.

II. DATA AND METHODOLOGY

Sources of Data

For the period 1959/60 to 1968/69, import price index, export price index and the terms of trade index were taken from the Central Statistical Office (C.S.O.) bulletins [8]. These were supplied to the C.S.O. by the Foreign Trade Wing of the Bureau of Statistics. The import data were compiled from the Daily List of Customs prepared at the port of entry and sent to the Foreign Trade Wing. The export data were also compiled from customs records at the port of exit. Both the export and import indices are unit value indices rather than price indices. This is a common practice because of the obvious difficulty of obtaining price figures for individual imported items.

It was very difficult to obtain reliable trade statistics for the post independence period. The Foreign Trade Wing of the Bureau of Statistics of the Government of Bangladesh faced many problems in compiling data. In fact they have not yet been able to compute detailed unit value indices for imports. The only option left to us under the circumstances, was to compute the index on the basis of some major import items, ourselves. For most of the unit values of these major import items, we depended on the figures of the Planning Commission. We obtained unit values of cotton textiles and iron and steel from the Trading Corporation of Bangladesh. Figures for imported chemicals were obtained from the Bangladesh Fertilizer and Chemical Products Corporation (BFCPC).

Unit values of exports for this period were computed from the various issues of *Advance Release* of the Foreign Trade Wing of the Bureau of Statistics [7]. There is no significant difference between unit values computed from the *Advance Release* and those computed from the revised estimates of the same office.

In addition to those mentioned above, some other statistics have also been used in the text for purposes of analysis. Sources of these are mentioned whenever they have been used.

Commodity Coverage

The index taken from C.S.O. bulletins [8] are based on complete coverage of all imports and exports of the then East Pakistan based on a six digit Pakistan Standard Trade Classification listing. This could not be done for Bangladesh, because the revised and detailed unit value index for imports based on a six digit Bangladesh Standard Trade Classification is not yet available. So we had to limit ourselves to major items of import and export. The import index consists of the following commodities.

1. Foodgrains
2. Edible Oil
3. Crude Petroleum
4. Petro-Products
5. Fertilizer
6. Iron & Steel
7. Chemicals
8. Cement
9. Coal
10. Cotton Textiles
11. Cotton Yarn
12. Raw Cotton

The commodities constitute over 70% of the total imports of Bangladesh. The following items constitute the export price index.

1. Raw Jute
2. Jute Manufactures
3. Hides and Skin (dressed) and Leather
4. Fish

These items account for about 95% of total export of Bangladesh. We have dropped tea, which is an important export commodity from the index. This is because tea was not a foreign export item in 1969/70, the base year. It became a major interwing export item, in the early sixties and by the middle of the decade all our tea exports were made to West Pakistan alone. After independence tea has become a foreign export item. Inclusion of tea in an index made for the primary purpose of comparing the price movement of exports with a pre-independence year would distort our analysis. Separate figures for leather for the first half year of 1972/73 was not available. It was therefore

decided to compute unit values for dressed hides and skin and leather lumped together. This is unlikely to distort the results significantly because dressed hides and skin and leather are not very different in terms of prices.

Selection of the Base Year and Period of Study

The C.S.O. indices were constructed with 1954/55 as the base year. It was decided not to change the base of the C.S.O. estimates used by us for the period 1959/60 to 1968/69. For the rest of our study, the main purpose was to analyse the relative price movements of exports and imports of the post independence period, in relation to a pre-independence base. Two considerations were made in selecting the base year for this later period of the study. First, the year had to be a recent one prior to independence in 1971 and second, it should not have been a bad year. Accordingly 1968/69, 1969/70 and 1970/71, turns out to be the best set from which to chose the base year. The later half of 1968/69 experienced serious political disturbances, which rendered it a bad year for Bangladesh. The year 1970/71 was a year of all time low economic activity owing to excessive political crisis resulting in a total War of Independence, so that this year also had to be ruled out from the choice set. Thus the obvious choice for the base year was 1969/70, the only recent and normal year from which we could study price movements. The year 1972/73 was dropped from our analysis mainly because of serious under coverage especially of imports and also of exports in that year. Figures for this period are extremely unreliable. The Bureau of Statistics have accepted this year as a bad one and hence it is not revising the trade statistics of this year.

A terms of trade series computed with 1969/70 as the base will be exaggerated because of the change in the rate of exchange in 1971 if we are considering the trends in relative prices of exports and imports only. In our study our main focus is on the movement of relative prices alone, so that we must eliminate the influence of exchange rate depreciation. This could be done in either of two ways : (a) by converting the 1969/70 rupee to bring it at par with the post December 1971 taka in dollar terms; or (b) by converting the post independence taka to the 1969/70 rupee in terms of dollars. It was much more convenient to perform the former exercise in our case. This was done by multiplying the 1969/70 rupee values by a constant factor of 1.68.[2]

[2]1969/70 rupee value would have to be divided by 4.76 (U.S. $1.00 = Rs. 4.76) which was the prevailing rate at the time to convert it into U.S. dollars and then this quotient would have to be multiplied by 8.00 (Tk. 8.00 = U.S. $1.00), the exchange rate after independence in December 1971.

Technicalities

In this study we are concerned with the net barter or commodity terms of trade and the income terms of trade or, the capacity to import. The formula for the net barter or, commodity terms of trade is given by :

$$T_n = \frac{P_x}{P_m} . 100.$$

where, P=Price index,
x=Exports,
and m=Imports.

The commodity terms of trade is then given by the ratio of export prices to imports prices. Changes in T_n show the different values of imports which could be received in exchange for a given volume of exports, on the basis of price relations alone. Given that both P_x and P_m change, an adverse change in P_m would have to be offset by a favourable change in P_x in order for T_n to rise. A rise in T_n would of course mean that more imports could be obtained, given the export volume, considering the existing price relatives.

The income terms of trade is defined as :

$$T_y = \frac{P_x}{P_m} . Q_x . 100 = \frac{V_x}{P_m} . 100.$$

Q_x is the volume of exports and V_m is the index of import value. Here the value of exports is deflated by the import price index so that clearly this becomes a measure of import capacity. It shows the purchasing power of imports. From the formula of income terms of trade, it can be seen that movements of the commodity terms of trade and the income terms of trade can take place quite independently of each other. The income terms of trade may decline inspite of a rise in the commodity terms of trade if the fall in export quantum more than offsets the rise in the price of exports relative to imports.

The Indices of Price of Export and Imports

Now let us go behind T_n and T_y and consider the indices that comprise these two terms of trade concepts. P_x, P_m and Q_x could be Laspeyres[3] index or a Paasche index[4] or the geometric mean of the two indices i.e., the Fishers' ideal index. Now, it is almost impossible to establish the superiority of either of the first two indices over the other. The choice between a Laspeyres and

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[3]Laspeyres index $(L_I) = \Sigma \frac{P_1 q_0}{P_0 q_0} . 100.$

[4]Paasche index $(P_I) = \Sigma \frac{P_1 q_1}{P_0 q_1} . 100.$

Paasche index depends upon the type of question we are asking. The Laspeyres index is a base year weighted index, while the Paasche index uses the weights of the current years. Unless there are significant structural changes the two indices should be fairly close to one another. In our study we are investigating how prices of goods traded in the base year have developed, rather than price trend of currently traded goods since the benchmark year. Hence, we use the Laspeyres price index.

Method of Computation

There is an almost universal problem with the quantity figures in international trade, the problem being under-reporting of quantity figures. In Bangladesh this problem is even more severe with a great percentage of quantity figures missing from import records. We have, for these reasons, used value weights and applied these to price relatives, rather than prices.

We have then : $P_0q_0 \cdot \frac{P_1}{P_0} = P_1q_0$.

Which expresses the base year quantity in the current year price? Individual commodities were then summed up and expressed as a ratio of base year value i.e., $\frac{P_1q_0}{P_0q_0}$.

Thus we have a price index with fixed quantity weights of the base year. The quantity index was derived indirectly as follows :

$$Q_x = \frac{V_x}{P_x} \cdot 100,$$

where, $Q_x = \frac{Q_1^x}{Q_0^x}$, the index of volume (quantum) of exports,

$V_1^x = \frac{V_1^x}{V_0^x}$, the index of value of exports and

$P_x = \frac{P_1^x}{P_0^x}$ is the index of price of exports.

It is simpler to derive the volume index indirectly because it can be computed from information we already have. The famous index number problem however sets in, when we carry out this indirect computation of the quantum index. This can be seen algebraically as follows :

$$Q_x = \frac{\frac{P_1^x \; Q_1^x}{P_2^x \; Q_0^x}}{\frac{P_1^x \; Q_0^x}{P_0^x \; Q_0^x}} \cdot 100 = \frac{P_1^x \; Q_1^x}{P_1^x \; Q_0^x} \cdot 100.$$

We divided a value index by a Laspeyres prices index and ended up with a quantum index of the Paasche type. This problem need not concern us too much, because for the period under consideration (post-independence) significant structural change in the foreign trade is assumed away. This is not an unrealistic assumption, since the Bangladesh trade structure has changed very little before independence in 1971. We may remind ourselves that quantum indices did not have to be computed for the first period (1959/60 to 1968/69), since we used indices computed by the C.S.O.

III. MOVEMENT OF TERMS OF TRADE

First Period—1959/60 to 1968/69

The commodity terms of trade of Bangladesh showed an overall favourable trend throughout the entire decade of the sixties. The terms of trade indices for this period are given in Table I below.

TABLE I

THE COMMODITY TERMS OF TRADE OF BANGLADESH

(1954/55=100)

Year	T_n	Percentage Variation in T_n over Previous Year
1959/60	90.36	
1960/61	138.13	+47.13
1961/62	111.74	−19.11
1962/63	91.31	−18.28
1963/64	102.90	+12.69
1964/65	120.06	+16.68
1965/66	109.77	−8.57
1966/67	156.99	+43.02
1967/68	128.81	−17.95
1968/69	130.88	+1.61

A time trend fitted to the T_n series confirms the upward trend : $T_n=118 +1.81t$. The 'b' co-efficient is significant at the 99% confidence level. (2.43)*

The year-to-year variation in percentage terms gives a good account of the fluctuation in the series over this period. On four occasions the terms of trade declined over the previous years, while in the remaining six years it increased.

*The figure in parentheses is the 't' statistic.

The sharpest increases over their previous years were in 1960/61 and 1966/67, while the sharpest declines over their previous years occured in 1961/62 and 1967/68. The average annual absolute variation was 18.50% over the entire period. The three year moving average centred on the mid-year, shows no decline in any year, in the terms of trade compared to the base year. This can be seen in Table II below.

TABLE II

MOVING AVERAGE OF THE COMMODITY TERMS OF TRADE OF BANGLADESH

Year	T_n	Moving Average
1959/60	90.36	
1960/61	138.13	113.41
1961/62	111.74	113.39
1962/63	91.31	101.98
1963/64	102.90	104.76
1964/65	120.06	110.91
1965/66	109.77	128.94
1966/67	156.99	131.86
1967/68	128.81	138.89
1968/69	130.88	

The moving average presents a more vivid picture of the favourable movement in the terms of trade in this ten-year period. The moving average declines for the first three years and then increases steadily with one relatively big leap in 1965/66.

The movement of the commodity terms of trade was a result of the underlying movement in the import and export prices. These are given in Table III.

TABLE III

THE IMPORT AND EXPORT PRICE INDICES OF BANGLADESH

(1954/55=100)

Year	P_m	Percentage Variation in P_m over Previous Year	P_x	Percentage Variation in P_x over Previous Year
1959/60	141.87		128.20	
1960/61	161.55	+13.87	223.15	+74.06
1961/62	154.13	—4.59	171.22	—22.82
1962/63	166.92	+8.30	152.41	—11.50
1963/64	144.97	—13.15	149.18	—2.12
1964/65	148.08	+2.15	177.78	+19.17
1965/66	156.14	+5.44	171.40	—3.59
1966/67	136.07	—12.85	213.63	+24.63
1967/68	136.86	+0.58	176.29	—17.47
1968/69	149.02	+8.88	195.02	+10.64

Both the export and import prices continued to remain well above the bench-mark year. The sharpest increase in the export price index took place in 1966/67, while the import price index registered the lowest rise in the same year compared to all other years. Hence the maximum improvement in the commodity terms of trade took place in this year. The year-to-year fluctuations in export prices was much larger than the year-to-year fluctuations in import prices. The average annual absolute variation in export prices on a year-to-year basis was 18.60% as against 6.98% in import prices. The export price variation was 2.66 times greater than variations in import price in year-to-year percentage terms.

As we have noted earlier the commodity terms of trade does not allow for changes in the volume of export trade. Allowing for this change we arrive at the income terms of trade, which measures the country's import capacity in terms of exports alone. The income terms of trade as a measure of import capacity, should not, however, be confused with the total import capacity, which depends on foreign aid and loan, earnings of nationals abroad, etc. The income terms of trade and the export volume index are presented in Table IV.

TABLE IV

THE INCOME TERMS OF TRADE AND INDICES OF VOLUME OF EXPORTS OF BANGLADESH

(1954/55=100)

Year	Q_x	Percentage Variation in Q_x over Previous Year	T_y	Percentage Variation T_y over Previous Year
1959/60	121.18		109.50	
1960/61	94.93	−21.66	131.13	+19.84
1961/62	108.09	+13.86	120.78	−7.89
1962/63	123.45	+14.21	112.72	−6.67
1963/64	120.74	−2.20	124.24	+10.22
1964/65	108.21	−10.21	130.16	4.76
1965/66	124.98	+15.28	137.19	+5.40
1966/67	118.40	−5.26	185.88	+35.49
1967/68	114.63	−3.18	147.65	−20.57
1968/69	139.79	+21.96	182.96	+23.91

The export quantum index[5] shows only one decline over the base year i.e., 94.93 in 1960/61. The series moved favourably on the whole. However, the underlying trend was not as favourable as the price trend in the period under consideration. This can be seen by comparing Tables III and IV. The average annual absolute variation of export volume was 10.78% as against 18.60% for export price i.e., export quantities were relatively more stable than prices. The

[5]The terms 'quantum' and 'volume' have been used interchangeably in this study.

improvement in the income terms of trade was greater than the improvement in the commodity terms of trade. A time trend fitted to the income terms of trade series, verifies this statement.

$$T_y = 138 + 3.6t. \quad (5.34)$$

The 'b' co-efficient (significant at the 99% level) is much greater in this case compared to 1.18 in the case of commodity terms of trade. The income terms of trade declined in 1961/62, 1962/63 and 1967/68. In the first two years the decline occurred because the rise in export volume was not sufficient to offset the decline in the commodity terms of trade. In 1967/68, however, both the commodity terms of trade and the export volume declined, the decline in the former being larger, thus resulting in a decline in the income terms of trade. The average annual absolute fluctuation in the income terms of trade was 13.48%, which is 73% of the fluctuations in the commodity terms of trade for the same period.

The three-year moving average centred on the mid-year for the income terms of trade series is given in Table V.

TABLE V

MOVING AVERAGE OF THE INCOME TERMS OF TRADE OF BANGLADESH

Mean	T_y	Moving Average
1959/60	109.50	
1960/61	131.13	120.47
1961/62	120.78	121.54
1962/63	112.72	119.25
1963/64	124.24	122.37
1964/65	130.16	130.53
1965/66	137.19	151.08
1966/67	185.88	156.09
1967/68	147.65	172.16
1968/69	182.96	

This table brings to the limelight very clearly the fact that the income terms of trade followed a more favourable trend than the commodity terms of trade. The annual variations are dampened and the series shows a consistent upward trend throughout the period, except for one year i.e., 1962/63, in which the income terms of trade declined.

A comparison of the values and prices of imports will tell us how import quantities have moved.[6] From the trend in import quantum, we can arrive at some interesting observations on the underlying economic policy for imports. Table VI shows the index of values and prices.

TABLE VI

INDEX OF VALUES AND PRICES OF IMPORTS OF BANGLADESH

(1954/55=100)

Year	V_m	P_m
1959/60	205	141.87
1960/61	317	161.55
1961/62	273	154.13
1962/63	318	166.92
1963/64	452	144.97
1964/65	531	148.08
1965/66	415	156.14
1966/67	489	136.07
1967/68	415	136.86
1968/69	578	149.02

Except for three years, values and prices considered from the base year, moved in the same direction. The exceptional years are 1963/64, 1965/66 and 1966/67. The increase in values was proportionately much higher than the increase in prices, on the whole. This means that there was an upward trend in the import volume during this period. Thus we find that import prices and quantities have both moved favourably i.e., a direct relationship between prices and quantities. This was probably a result of the policy decision to import more of the commodities whose prices were rising.

6(a) If $\frac{P_1Q_1}{P_0Q_0} < \frac{P_1Q_0}{P_0Q_0}$, then $\frac{P_1Q_1}{P_1Q_0} < 1$.

(b) If $\frac{P_1Q_1}{P_0Q_0} > \frac{P_1Q_0}{P_0Q_0}$, then $\frac{P_1Q_1}{P_1Q_0} > 1$.

Where, $\frac{P_1Q_0}{P_0Q_0}$ = Laspeyres Index,

and $\frac{P_1Q_1}{P_1Q_0}$ = Paasche Quantity Index.

Second Period—1969/70 to 1974/75

We now turn to examine the movement of terms of trade in the post-liberation period in relation to a pre-liberation base period, i.e., 1969/70. The commodity terms of trade of Bangladesh in this period is given in Table VII below.

TABLE VII

THE COMMODITY TERMS OF TRADE OF BANGLADESH, 1969/70 TO 1974/75

Year	T_n	Percentage Variation of T_n over Previous Year.
1972/73	91	— 9.00
1973/74	49	—46.28
1974/75	54	+10.20

As is evident from Table VII, the commodity terms of trade of Bangladesh, deteriorated drastically, since 1969/70. The index was lowest in 1973/74. It fell very sharply between 1972/73 and 1973/74, the decline being a phenomenal 46.2%. The terms of trade, however, improved by 10% in 1974/75 over the previous year. The annual average variation in the terms of trade was 21.8%. Both the commodity terms of trade and the excessive year-to-year variation present a grim picture for the country.

The behaviour of the commodity terms of trade, can be attributed to the movement of import and export prices in the post-independence period. The import and export price indices and their year-to-year variation is given in Table VIII below.

TABLE VIII

IMPORT AND EXPORT PRICE INDICES OF BANGLADESH

(1969/70=100)

Year	P_m	Percentage Variation of P_m over Previous Year	P_x	Percentage Variation of P_x over Previous Year
1972/73	126	+26.0	115	+15.0
1973/74	239	+89.7	118	+ 2.6
1974/75	267	+11.7	143	+21.2

In every year $P_m > P_x$ and hence the deterioration in the terms of trade. The rise in import prices in 1972/73 was much less compared to 1973/74 and 1974/75, when the import prices sky-rocketed suddenly. The prices of imports nearly doubled in 1973/74 and more than doubled in 1974/75 compared to the base year. There was a sharp increase of 89.7%, in the import price index, in 1973/74 over its previous year.

The export prices on the other hand rose considerably less than import prices. While the import price index stood at 239 in 1973/74, the export price index stood at a meagre 118, hence the alarming deterioration in the commodity terms of trade, in that year. The export price index rose very sharply in 1974/75. This is a reflection of the pressure of domestic inflation on the costs of production of the export industries which in turn pushed up prices. The average year-to-year increase in import price was 47.47% against 12.93% in export prices i.e., import prices rose at a rate three times higher than export prices.

Now let us look into what has been happening to the volume of exports and the income terms of trade of Bangladesh in the post-independence period. These two indices are given in Table IX below.

TABLE IX

THE INCOME TERMS OF TRADE AND THE INDICES OF VOLUME OF EXPORTS OF BANGLADESH

(1969/70=100)

Year	T_y	Percentage Variation in T_y over the Previous Year	Q_x	Percentage Variation in Q_x over the Previous Year
1972/73	74	—24.0	84	—16.0
1973/74	45	—40.8	91	+ 8.3
1974/75	42	— 6.7	78	—14.3

The export volume in 1972/73 was well below the 1969/70 level. It increased by 8.3% the following year, over the past year and then fell sharply in 1974/75. The sudden steep fall in export volume seems to be the result of sharp decline in raw jute production as a result of the unfavourable jute rice price ratio, prevailing at the time. Domestic inflation pushed up the costs of production in the jute goods industry [1] and the recession in the developed capitalist economies resulted in a serious decline in jute goods exports. The year-to-year average absolute variation in quantity of export was 12.87% almost exactly equal to the variation in prices of export, which was 12.93%. The income terms of trade registered a continuous decline. The deterioration in the commodity terms of trade was further aggravated by an even more adverse movement of quantities

of exports, to yield an equally alarming income terms of trades series. The fall in export volume in 1974/75 was proportionately greater than the increase in export prices, hence the income terms of trade deteriorated further in this year, even though the commodity terms of trade had improved somewhat in the same year.

We really cannot arrive at conclusive welfare statements by analysing simply the net barter and income terms of trade. The latter of course does tell us something about the gains from trade mainly because it is an indicator of the capacity to import. But commodity terms of trade does not tell us very much. Prices of exports may fall due to improvements in the productivity of the export sector or due to a shift in the foreign offer curve. In the first case, a fall in the commodity terms of trade has a more favourable welfare implication, because the export sector has become more efficient. This brings us to the concept of the single factoral terms of trade[7] (T_s), which corrects the commodity terms of trade for changes in productivity in the production of exports. However, in Bangladesh the problems of constructing export productivity index are far too many, to make the exercise useful.

IV. IMPLICATIONS

Let us now consider the implications of our findings regarding movement of terms of trade during the periods 1959/60 to 1968/69 and 1969/70 to 1974/75.

First Period—1959/60 to 1968/69

(i) Bangladesh was trading at favourable commodity terms of trade in the period 1959/60 to 1968/69. This means that the relative prices of exports to imports was in the country's favour and it received more imports in exchange for her exports. There was therefore an increase in real income over this period.[8]

(ii) The income terms of trade showed an even more favourable trend. Increases in volume of exports augmented the improvements in the commodity

[7]Single factoral terms of trade may be expressed as :

$T_s = \frac{P_x}{P_m} \cdot E_p$ where,

P_x = Export Price Index,

P_m = Import Price Index,

and E_p = Export Productivity Index.

[8]The trend of prices of exports relative to imports was more favourable in the last five years of the decade, so that the terms of trade of trade improved more in the period 1964/65 to 1968/69 compared to 1959/60 to 1963/64.

terms of trade. The upward trend of the import capacity is extremely important for Bangladesh which has a relatively high average and marginal propensity to import. The increased export volume did not result in a switching of the existing price ratio in favour of exports. Prices and quantities of exports both increased. This is a reflection of our domination of the raw jute and jute goods market in the decade under consideration. It was only in the last three years of this decade that substitutes started to make noteworthy headway in our jute market, that too because of unrealistic pricing of jute.

(iii) The trade balance expressed as a ratio of the value of exports to imports[9] improved in seven years, while it deteriorated in the remaining three years, these being 1963/64, 1964/65 and 1968/69. Inspite of unfavourable movement in the quantity of imports relative to quantity of exports i.e., the inverse of the standard gross barter terms of trade $\left(\frac{Q_m}{Q_x}\right)$ and the policy of importing more of the commodities whose prices increased more, the trade balance on the whole showed a surplus. The policy measure should be such as to control the volume of imports, while boosting export volume so that the gross barter terms of trade deteriorates. Since this was not the case, the gains from a favourable movement in the commodity terms of trade i.e., relative prices, did not prove useful enough.

(iv) The absolute variation in export prices were considerably greater than that import prices. Thus the evidence on which LDC's have for long negotiated with the DC's for ensuring stabler prices for their exports, holds for Bangladesh. Quantities of exports remained comparatively more stable. It appears therefore that the bottleneck is greater on the side of demand rather than supply.

(v) The improvement in the commodity terms of trade in this period is concomittant with a decline, in the primary product ratio i.e., ratio of primary products to total exports. The correlation co-efficient, between the index of primary products ratio and the terms of trade (T_n), works out to be – .60. This highly significant inverse relationship between the primary product ratio and the

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[9]The trade balance (B) can be expressed as $\frac{X}{M}$ instead of the usual X—M.

$$\text{Let us consider } B = \frac{X}{M} = \frac{P_m Q_x}{P_m Q_m} = \frac{P_x}{P_m} \cdot \frac{Q_m}{Q_x},$$

which is nothing but the net barter terms of trade divided by the gross barter terms of trade. The advantages in expressing B as $\frac{X}{M}$ is that it allow us to analyse B into the component terms of trade concepts, associated with it.

commodity terms of trade lends support to the Singer-Prebisch-Lewis-Myrdal hypothesis of deteriorating terms of trade of primary commodities vis-a-vis manufactured goods. Crucial to the hypothesis is the contention that productivity changes have not caused this deterioration, but that in fact they have improved the terms of trade. Given the scope of this study and lack of relevant data, we cannot verify this latter conclusion empirically.

Second Period—1969/70 to 1974/75

(i) A severe deterioration in the net barter terms of trade during this period implies a serious loss in the purchasing power of the exports of Bangladesh. This has aggravated the decline in real incomes of the people and the country as a whole.

(ii) Export volumes declined seriously, only to accentuate the fall in the income terms of trade i.e., an inward shift in the foreign offer curve, given the domestic offer curve. Bangladesh's capacity to import was thus severely impaired in a situation of great scarcity. This resulted in a serious balance of payments crisis. Dependence on foreign aid and loan increased immensely. Given that the aim of development policy is to reduce dependence on foreign assistance with the ultimate objective of self-reliance, the serious reduction in capacity to import (from exports alone) represents a clear welfare loss.

(iii) The decline in the commodity terms of trade need not necessarily have serious implications for welfare. As long as productivity of the export sector is rising faster than the rate at which export prices are falling the country's real income clearly rises, even though the commodity terms of trade might decline. Under such circumstances, therefore the country gains from international trade. But in the case of Bangladesh the limited evidence available indicate that the single factoral terms of trade i.e., the quantity of imports that could be obtained per unit of input used up in export production, declined along with a severe decline in the commodity terms of trade. The decline in productivity was probably greater than the rise in export prices. Thus we can conclusively say that Bangladesh suffered a welfare loss from international trade in the years after independence till 1974/75.

(iv) Primary exports of Bangladesh i.e., raw jute, hides and skins and tea, suffered heavy losses in the period under review. Besides, the series is also very short only three years. Thus attempts to study the relationship between the primary-product ratio and the terms of trade and the implications theoreof was not undertaken.

Foodgrain import has consistently been the single largest import item. Hence agricultural policy and commercial policy are vitally related in the Bangladesh context. In the past domestic agricultural policy failed to bring forth significant increases in foodgrain production, so that this major consumer good import had to increase to meet the growing deficit. The import composition and distribution shows clearly that only the urban upper and middle classes could benefit from imports, and that the imports did not add significantly to the generation of productive capacity in the economy. The pattern of income distribution and domestic output of the country particularly in the late 1960's must have been adversely affected. Trade and commercial policy failed to meet the plan objectives of reducing dependence on foreign aid and loan. In fact dependence on foreign aid and loan increased progressively in this decade.

We have already noted that in the post-independence period, Bangladesh had little choice regarding its imports. But now a more careful assessment of trade policy must be made. In the past there have been alarming gaps between proposed objectives and policies pursued to achieve these objectives in every sector. Bangladesh has well defined goals of achieving an even distribution of income by allieviating the economic misery of the poor masses. Every effort must be made to boost agricultural production, so as to reduce and gradually eliminate the foodgrain deficit. A minimum consumption package consisting of necessary consumer goods imports should be ear-marked in order to limit consumer goods imports. In encouraging exports the emphasis should be on semi-manufactures and manufactures. This will serve the important purpose of reducing the primary product ratio and thereby protecting export revenues from fluctuating due to excessive price fluctuations, the assumption here, being that primary exports prices fluctuate more than manufactured exports. As far as possible resources should be diverted away from those exports, in which the productivity of factors is declining faster than the rate at which prices are rising. Imports and exports must be planned in the framework of a longer run perspective, instead of a year-to-year basis.

V. CAUSES UNDERLYING MOVEMENT TERMS OF TRADE

It is clear from the preceding discussion that the movement of the terms of trade was characterised by a favourable trend in the period 1959/60 to 1968/69 and an unfavourable trend in the period 1969/70 to 1974/75. We will now consider the probable causes for the trend in the terms of trade in the two periods.

First Period—1959/60 to 1968/69

The world demand for Bangladesh exports and the domestic supply of exports, both were favourable to Bangladesh during the period under review. Bangladesh

took full advantage of her jute demand in America, Western Europe, Japan and the newly found Chinese markets, which constitute 85% to 90% of her exports. The sharp price hikes of raw jute and jute goods, in the latter half of the decade, did not lead to a fall in the quantities demanded of these two goods in the short-run. The short-sighted pricing policy, proved fatal in the longer run as it created a positive cross-elasticity effect and by 1970/71, synthetics began to make serious inroads into the jute market. Bangladesh dominated, the world raw jute market and was second only to India in the jute products market. Here too, Bangladesh had the edge over India in the quality of jute goods. Thus the usual contention of a high price elasticity for Bangladesh jute, does not seem appropriate at least in the period, we are considering.

Factors like commercial policy, rate of exchange, nature and extent of foreign aid and loan, international demonstration effects, will cause the terms of trade to change. In the long run, these changes will be influenced by the nature and pace of economic development via structural variations in poduction and consumption as a result of development. Pakistan had experienced a fair degree of import substitution throughout 1950's in the consumers goods industries and more so during 1960's when it was extended to intermediate goods and capital goods industries. The then East Pakistan (Bangladesh) was just another Province of Pakistan, so the domestic supply of importables increased in Bangladesh also. In the light of international trade theory, the Pakistani development in latter decade can be termed as "import-biased" (anti-trade bias).

The import trade in that period was beset with all kinds of control mechanisms, which makes it very difficult to evaluate hypothesis regarding import prices. The import trade however was carried on by private traders, in the main. Commission agents of foreign suppliers quoted the c.i.f. prices. Now, the increase in the domestic supply of imports, could have exerted pressure on the importers to come down on this price quoted by them thereby forsaking their commission somewhat. Another extremely important factor for the import prices to remain low was the entry of low-priced, Chinese goods in the Bangladesh market early in the decade. (By the end of the decade these goods had flooded the market.) This suggests to us that the price elasticity of demand for imports was high. This however cannot be true for certain essential imports e.g., foodgrains.

Bangladesh is mainly an exporter of jute—an industrial raw material. The foreign income elasticity of demand for industrial raw material, at any given time period, would depend on whether there is a recession or boom in the foreign economy. The period 1960-1965 was a period of relative prosperity for the developed market economics of the world. The index of industrial production

rose impressively throughout this period. The index declined somewhat in 1966/67 and then picked up again, for the major capitalist countries as a whole [19 ; 20]. The major trading partners of Bangladesh, U.S.A., Japan, Western Europe and China, however experienced high industrial growth throughout the sixties. The only major trading partner which suffered a setback in 1965/66 was the U.K. Nevertheless, her imports of Bangladesh jute was not affected in any significant manner. As the industrial production index in the major jute consuming countries rose, the quantum of jute goods exports increased nearly three-folds between 1959/60 to 1968/69. It is evident, therefore, that the income elasticity of foreign demand for our exports was relatively high. As for our income elasticity of damand for imports, it should be fairly high. Bangladesh however is a small country, so that even with a very high marginal propensity to import, it is difficult for her to affect the world prices.

Second Period—1969/70 to 1974/75

The reasons for the terms of trade to deteriorate are not far to seek. An understanding of the circumstances which prevailed in the international trade sector of Bangladesh, will explain this deterioration.

Exports

Jute substitutes had begun to enter the jute market in the early 1960's. The competitiveness of these synthetic substitutes was increasing gradually. The cross-price elasticity of jute goods in relation to synthetic substitutes was certainly greater than unity, especially in the latter half of the decade. This is especially true of the U. S. jute goods market, which we lost almost completely by 1971/72, because of the sharp price increases from 1965/66 through 1970/71. This was a highly unrealistic pricing policy pursued by the Government at that time. The European Economic Community increased its tariff barries in a bid to protect their own jute industry in the initial years after the independence of Bangladesh. Apart from these losses, Bangladesh faced an overall loss in the world jute market, mainly due to inflation induced cost increases in production which drove up prices and due to mismanagement. These factors coupled with an industrial labour unrest brought the production (export) levels to an all time low. The price at which Bangladesh offered to sell jute goods in the international market, was too high. Hence there was a stock piling of jute goods in the country, while the Indian jute industry experienced a 'boom' and made heavy inroads into the jute market of Bangladesh.

During this period we also lost our dominant position in the world raw jute market. Domestic inflation affected raw jute in two ways; (a) it pushed up the

costs of production; (b) it was such that the ratio of jute price to rice price became highly unfavourable. The cost induced rise in export prices, affected the competitiveness of raw jute seriously. The production of jute fell very sharply. Recession in the developed capitalist world, the major consumer of jute from Bangladesh, lead to a drastic reduction in her exports. Due to delay in establishment of diplomatic relationship after independence the Chinese jute market was lost completely. The entire jute trade was controlled by non-bengali private traders supported by their London Business Houses. Departure of these non-national traders and the nationalisation of both the jute goods and raw jute sectors created serious management problems. High-handed and insincere handling of this sector by officials, added to the existing misery in this sector.[10] Effective measures to make nationalisation a success were not undertaken. The two other important exports, hides and skins and tea, both faced similar problems. Tea which was an inter-wing trade commodity prior to independence, found its way into the international market after independence. The prices received by tea in the world market was very low, because of its low quality. We have however not included tea in our export index, for reasons stated before. The increase in export prices was insignificant relative to the rise in import prices.

Imports

The decade of 1970's began with serious inflation in the Western market economies. The oil price hike beginning mid-1973 resulted in an 'energy crisis' in these countries and a recession set in. The world prices of imports shot up suddenly. Consumer goods accounted for about 55.58% (on the average) of the total imports of Bangladesh in the post-independence period. Within this category foodgrain occupies the most important place, accounting for nearly 30%—35% of total imports in the same period with its price rising over three-folds in this period. The enormous petroleum price increases in 1973 and 1974 is popularly believed to have caused the terms of trade of LDC's including Bangladesh to deteriorate. To ascertain this let us see Table X below.

TABLE X

IMPORT PRICE INDEX WITH AND WITHOUT POL

Year	P_m	P_m (excluding POL)
1972/73	126	119
1973/74	239	213
1974/75	267	242

[10]This was learnt from interviews with officials of various Jute Corporations and Associations throughout the later six months of 1975.

The general level of import prices rose enormously even if we exclude POL from our index. This finding should end the popular speculation about oil price hikes having been the major reason for spiralling import prices. Of course the oil price rises affected the LDC's including Bangladesh. But this was felt more through the crisis generated economics i.e., the sudden price increase of DC exports which is said to be a result of the 'energy-crisis'. Thus on the one hand the prices of imports rose very rapidly and on the other hand export prices had risen insignificantly relative to import prices (though not in absolute terms), so that the terms of trade declined severely. Quantities of export failed to respond favourably to higher prices, thus reflecting supply inelasticity. At the same time export quantities came under pressure from a shift in the foreign offer curve. Thus the income terms of trade i.e., the capacity to import was greatly reduced.

VI. CONCLUSION

The computation of the terms of trade pose a number of nearly intractable questions. Criticisms of all the various terms of trade concepts abound in the literature. In view of the methodological problems involved the analysis in this paper must be accepted with caution. The ommission of the aspect of Interwing trade in the 1960's remains a serious handicap of that part of our study. The terms of trade for that period refer to the trade of the then East Pakistan with the rest of the world only. During the period under consideration about 30% to 35% of the total trade volume comprised of 'interwing trade'. The terms of trade series and hence the implications could have been somewhat different if the trade with Pakistan were considered along with the trade with other countries. The commodity terms of trade moved in favour of Bangladesh in the decade of the 1960's. The purchasing power of our exports also increased. But the gains from international trade certainly did not filter through to the cross-section of various classes in the society, so that one cannot claim that welfare implication of the impressive terms of trade trend in the 1960's were favourable. The import volume rose very rapidly. If Pakistan as a whole is considered then it is seen that consumer goods imports formed largest category of imports [4]. Dependence on foreign aid and loan continued to rise in this decade. The policy of consumption liberalisation [12] simply lead to the emergence of an affluent upper class in Bangladesh at the cost of millions of poverty-stricken people. The Bangladeshi foreign trade section was controlled by a non-national mercantile class (Pakistanis) and it is they who benefitted from the improved terms of trade in the 1960's. In the post-independence period, we observed a serious decline in the terms of trade of Bangladesh. This is in no way an indication of the impact on the Bangladesh Economy of the break-up of the erstwhile customs union, namely Pakistan. This is simply a result of the

general disorder prevailing in the domestic front and an economic crisis in the advanced capitalist bloc, in this period. We have seen that the hypothesis regarding oil price rises as being the major cause of the deterioration in the terms of trade did not stand up to empirical test.

The grim picture that emerges certainly improved after 1974/75. The devaluation of May 1975 and the end of 'stagflation' in the capitalist bloc, had helped jute and jute goods exports to pick up. The world prices of imports have fallen considerably. The domestic management of jute and the overall working of the jute sector has improved significantly, after the political change of November 1975. All these imply that the terms of trade of Bangladesh has improved since 1974/75. However, it is still difficult to believe that the terms of trade on a 1969/70 base and after allowing for devaluation has registered an increase. After having emerged from the difficult post-war phase, the choice-set of the Bangladeshi policy makers has widened. The sensitive issue of dependence on foreign assistance is also influenced by the important terms of trade variable in the strategic balance of payments equation. The objective of commercial policy has to be in line with the general economic policy of greater welfare for the masses.

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Notes

A Note on Some Aspects of Money and Capital Markets in Lowest Income Countries

by

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One of the most acute problems facing a number of less developed countries, particularly in Africa and among those classified as least developed, is an apparent lack of productive investment opportunities. In the lowest income countries, this is in part explained by the highly fragmented nature of their economies [7, Chapter 3; 8; 12, Chapter 2]. There is little interaction between government, the modern private sector, the bazaar and the subsistence sectors. There are few linkages and a lack of any multiplier process, a result primarily of the absence of complementary economic activities. The demonstration effect fails here. Fragmentation is also a geographic phenomenon: markets are small because transportation costs are high. Under such circumstances, division of labour and economies of scale cannot occur to anything approaching the extent necessary to affect significantly the overall level of productivity.

Fragmentation does not, however, imply the total lack of productive investment opportunities. An entrepreneurial cadre, even if only in embryonic form, exists in virtually all less developed countries [1, pp. 461-68]. Where it does, so by definition do profitable investment opportunities. But, the number of these opportunities actually exploited under such circumstances is too small to have any macroeconomic impact.

Research in both Afghanistan [7, pp. 205-206] and Nepal [8, pp. 21-22] suggests that there were highly productive investment opportunities in countries where governments and foreign aid donors could find none. Nevertheless, investment in these small scale opportunities had little impact on the overall rate of growth because there was limited entrepreneurial talent with which to exploit them. Furthermore, fragmentation limited expansion of existing activities due to the market size constraint. McKinnon and Shaw suggest that financial development can itself reduce fragmentation and raise the volume of productive invest-

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ment opportunities [12, pp. 57-61; 16, pp. 120-25]. The latter will be created through a policy of general liberalisation of which financial reform is one component. Evidence from Africa may be used to question the general applicability of this assumption. For example, Schatz concluded that in Nigeria "....rather than a large number of viable projects vainly seeking capital, capital has been vainly seeking viable private projects" [15, p. 316]. This, he suggests, is the case in many other less developed countries. Throughout Africa, Bhatia and Khatkhate found that the problem was ".. . not so much a scarcity of capital as of bankable projects" [2, p. 152].

In response to the claim of shortage of investment opportunities, high non-institutional interest rates can be used as evidence of capital scarcity. Indeed, Ladman has shown that high non-institutional interest rates in Mexico indicated high opportunity cost of capital because of the existence of high marginal returns from small scale investment [11, pp. 61-66]. Nevertheless, in the lowest income countries high non-institutional interest rates may well reflect high rates of time preference rather than high rates of return to investment, since non-institutional borrowing is primarily for consumption purposes here.

But even if profitable investment opportunities exist, they are not necessarily translated into effective demand for investible funds. McKinnon and Shaw recognise this possibility but pass on without undue concern, in part because they assume that financial development will itself create demand for investible funds if necessary [12, pp. 78-79; 16, pp. 123-25]. However, the basis for this assumption is lacking in the lowest income group of less developed countries. Indeed, low institutional interest rates there are the result of low effective demand for institutional credit rather than below-equilibrium, administratively determined rates.

Examples of non-financial bottlenecks between investment opportunity and effective demand for institutional credit abound (e. g., [10, p. 538]). First, investment opportunities can be tied to the potential entrepreneur. Information costs may be very high and/or the opportunity require the entrepreneur's unique skills for its exploitation. Second, the entrepreneurial cadre may not possess the necessary literacy to formulate project proposals for the purpose of soliciting institutional finance. This would not be too grave a situation were it not for a third factor, namely, an insufficient quantity and quality of bankers.

Gerschenkron makes the following point on the relationship between the second and third factor listed above:

> The inadequacy in the numbers of available entrepreneurs could be remedied or substituted for by increasing the size of plant and enterprise above what otherwise would have been an optimal size. In Germany,

> the various incompetencies of the individual entrepreneurs were offset by the device of splitting the entrepreneurial function: the German investment banks—a powerful invention, comparable in economic effect to that of the steam engine—were in their capital-supplying functions a substitute for the insufficiency of the previously created wealth willingly placed at the disposal of the entrepreneurs. But they were also a substitute for entrepreneurial deficiencies [9, p. 137].

In the lowest income countries, not only are skilled bankers in short supply but more often than not banking has been developed along the Anglo-Saxon model rather than along German or Japanese lines. Furthermore, the banks which have been established in these countries are rarely creatures of the industrialist class, an important point in regard to the development of banking in eighteenth century England, nineteenth century Russia and twentieth century Japan [4, pp. 12-21].

In many less developed countries, investment opportunities remain unfinanced because banks do not engage in medium or long term lending and because there are no other financial intermediaries or markets to provide such facilities. This situation can be a result of legal restriction and/or lack of expertise within the banks in project appraisal techniques. The following example from Brazil in the early 1960s is typical:

> The qualifications of the staffs of both banking and non-banking financial institutions were weak with credit granted primarily on the basis of security or personal connections rather than on the commercial or developmental importance of the object of the financing [13, p. 463].

In East Africa,

> The present method is to look first at the securities offered, secondly at any additional securities which can be obtained, thirdly at how short the period to maturity is, fourthly at the commissions to be received in connection with the granting of credit, fifthly at the standing of the would-be borrower, sixthly at the amount and seventhly at the project [14, p. 249].

In Guyana [3, pp. 119-20], Malaysia [5, pp. 145-46] and Pakistan [17, p. 636], exactly the same behaviour is reported. Throughout Africa, Bhatia and Khatkhate found that financial institutions preferred to lend to those with good collateral rather than good projects [2, p. 136]. In the lowest income countries, this preference naturally implies that most indigenous entrepreneurs cannot obtain institutional credit [14, p. 249]. In other words, they have no effective demand for investible funds.

It is possible that such behaviour is a result of financial repression. Indeed, McKinnon and Shaw point out that interest rate ceilings will produce conservative, ultra-safe lending policies. However, there is no administratively imposed interest rate ceiling in Afghanistan; yet here exactly the same behaviour is found. In Nepal, the interest rate ceiling is not effective and the same behaviour is also found. Furthermore, an interest rate ceiling is an extremely easy control to circumvent [6, pp. 137-45].

In Afghanistan, difficulties of debt collection constitute the most serious constraint on effective demand. Legal problems arise from the influence defaulting borrowers continue to hold over the disposal of their collateral, slow and inefficient court procedures, the political and social influence of the borrower, and corruption. Management problems arise from inadequate training, particularly in audit and inspection procedures, for middle and upper management, and nepotism. For these reasons, borrowers have had to meet increasingly stringent collateral requirements. Hence, effective demand for institutional credit has remained small and stagnant [7, pp. 137-46].

In Nepal, the most serious constraints on effective demand are the legal restrictions on bank lending and bureaucratic inefficiencies. These combine to ensure that institutional lending is extended almost exclusively to traditional, low risk activities, which in Nepal means trade. Almost all loans are secured against goods under placement, thereby ensuring a minuscule effective demand for institutional credit. In strong contrast to the situation in Afghanistan, default rates are negligible in Nepal [8, pp. 26-28]. Law is too restrictive and protective here, where in Afghanistan the legal system fails to provide adequate support to institutional lenders.

This note questions the McKinnon-Shaw assumption that there is "no shortage of investment opportunities" and the implication drawn from it that there is generally an excess effective demand for institutional credit in most less developed countries. In particular, it has been suggested that in the lowest income countries not only may there be some shortage of investment opportunities but there is also a bottleneck between productive investment opportunities and effective demand for institutional credit. This being the case, a somewhat different programme of financial development to that advocated by McKinnon and Shaw suggests itself. To be effective, it must be implemented as part of an overall strategy to reduce fragmentation. Emphasis is required on raising effective demand for investible funds before or at least in conjunction with McKinnon-Shaw policies designed primarily to increase supply.

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A Note on Farm Size, Efficiency and Socio-economics of Land Distribution

by

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I. INTRODUCTION

In a recent note [7] on a paper by Anisur Rahman [8], Mr. Quibria has rightly pointed out that the results of Mr. Rahman are highly sensitive to the value of E, the elasticity of work efforts with respect to farm size. If E is less than unity almost all the conclusions of Mr. Rahman holds both for constant and increasing returns to scale but if $E \geq 1$ most of the results become invalid. Here I shall prove that even with increasing returns to scale ($r > 1$), E will be less than 1 under a wide range of plausible assumptions. In particular we shall show that $E > 1$ implies,in most cases, implausibly high values for r.

Throughout this analysis $C_{11} > 0$ and $r > 1$ are assumed (since there is no problem for $r=1$), i.e., we assume that the marginal compensation rises with the increase of labour and increasing returns to scale prevail in the industry.

II. THE INEQUALITY

Let our investigation start from the inequality set out by Mr. Quibria in the (2,2)th cell of his table on page 137 :

$$E \gtreqless 1 \quad \text{as} \quad (r-1) \frac{f_1(x)}{(x)} \gtreqless C_{11} \qquad (1)$$

Mr. Quibria's presentation may lead one to believe that this relationship is valid only for $r > 1$, $C_{11} > 0$. In fact it is a perfectly general relationship, the entries in the other cells being special cases. This can easily be varified from the expression for E,

$$E = \frac{f_{11}}{f_{11} - C_{11}} \rightarrow \frac{(r-1)\ [\, f_1(x)/x \,]}{f_{11} - C_{11}}$$

($f_{11} < 0$), due to diminishing marginal productivity)

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*The auther is an undergraduate student at Dacca University. He is indebted to Mr. Abu Abdullah of BIDS for his help and suggestions. Mr. Abdullah after reading the original paper of the author suggested that his results could be established using this new simpler and better approach. He also would like to thank Mr. Zafar Ahmed of the World Bank for his comments and encouragement.

III. VALUE OF E DEPENDS LARGELY UPON r

Assume that the compensation function, C(x), is at least thrice differentiable and that the third derivative is at least continuous. Expanding $C_1(x)$ around x to obtain an expression for $C_1(0)$ by the Mean Value theorem of second order, we get,

$$C_1(0) = C_1(x) - x \cdot C_{11}(x) + \tfrac{1}{2} C_{111}[\alpha x] x^2 \quad 0 < \alpha < 1$$

$$\text{or, } C_1(x) = C_1(0) + x. C_{11}(x) - \tfrac{1}{2} C_{111}[\alpha x] x^2$$

$$\text{or, } \frac{C_1(x)}{x} = C_{11}(x) + \left[\frac{C_1(0)}{x} - \tfrac{1}{2} C_{111}[\alpha x].x\right] \qquad (2)$$

Case 1. $C_1(0) = 0, C_{111} > 0$
(the most plausible case)

$$\therefore \quad \frac{C_1(x)}{x} < C_{11}(x) \text{ for all } x.$$

At the point of surplus maximization, x_o, $C_1(xo) = f_1(x_o, \bar{Z})$

$$\therefore \quad \frac{f_1(x_o)}{x_o} < C_{11}(x_o)$$

Hence there exists some $r^* > 2$ such that for all $r < r^*$

$$(r-1)\ \frac{f_1(x_o)}{x_o} < C_{11}(x_o)$$

which means E is less than unity.

This can be illustrated by Figure 1 :

The slope of the line labelled R is $m \equiv \frac{f_1(x_o, \bar{z})}{x_o}$ and that of R′, which is parallel to $C_{11}(x_o)$ is $(r^*-1)m$, $r^* > 2$.

Clearly given $m < C_{11}(x_o)$, (r-1) m will be less than $C_{11}(x)_o$, for all $r < r^*$.

Case II. $C_1(0) = 0, \quad C_{111} = 0$

Then $\frac{C_1(x)}{x} = C_{11}(x)$ for all x

At x_o therefore,

$$\frac{f_1(x_o)}{x_o} = C_{11}(x_o)$$

Hence for all $r < 2$,

$$(r-1)\frac{f_1(x_o)}{x_o} < C_{11}(x_o), \text{ again } E < 1.$$

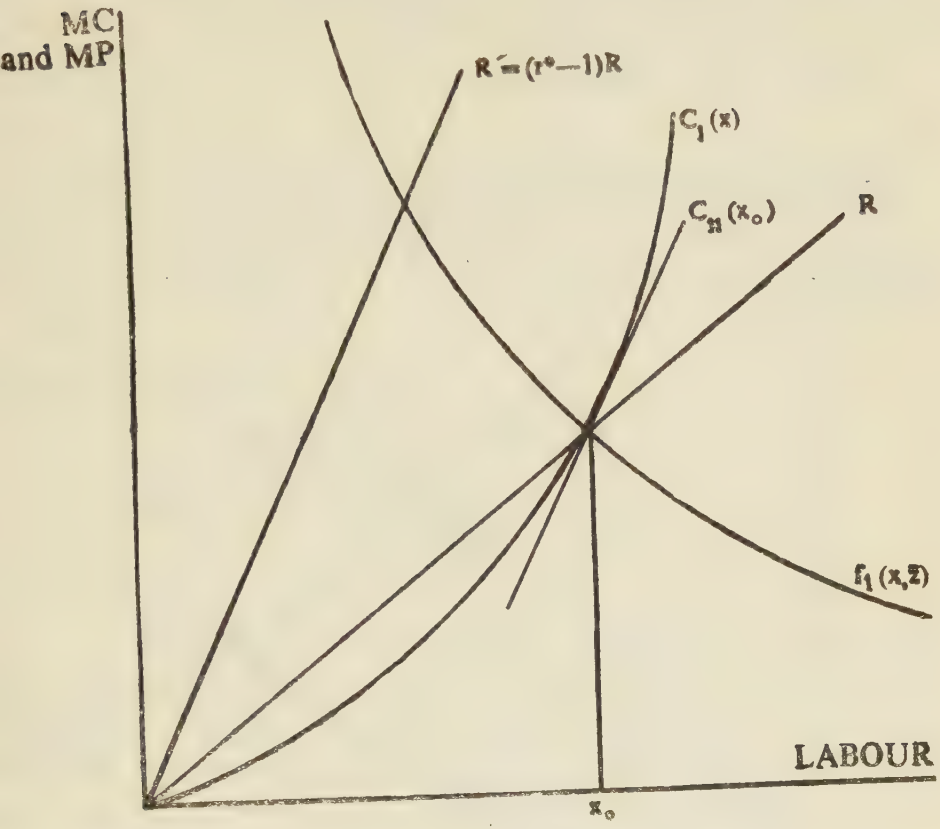


Figure 1

$C_{111}=0$ means C_{11} is constant. If C_{11} is constant and if x_0 is the equilibrium point (the point of surplus maximization), the ray R itself becomes the graph of C_1 in Figure 1. Then at equilibrium $C_{11}=f_1/x$, and therefore for all $r < 2$, $(r-1).f_1/x < C_{11}$ and so $E < 1$.

Case III a. $C_1(0) \geqq 0$, $C_{111} > 0$

Then $\dfrac{C_1(x_0)}{x_0} > C_{11}(x_0)$

Clearly, one can make $(r-1)$ as close to zero as desired by taking r close to 1, $1 < r < 2$; thus there exists some $r^* < 2$ such that for all $r < r$

$$(r-1) \quad \frac{f_1(x_0)}{x_0} < C_{11}(x_0) \text{ or } E < 1.$$

This can be illustrated as follows :

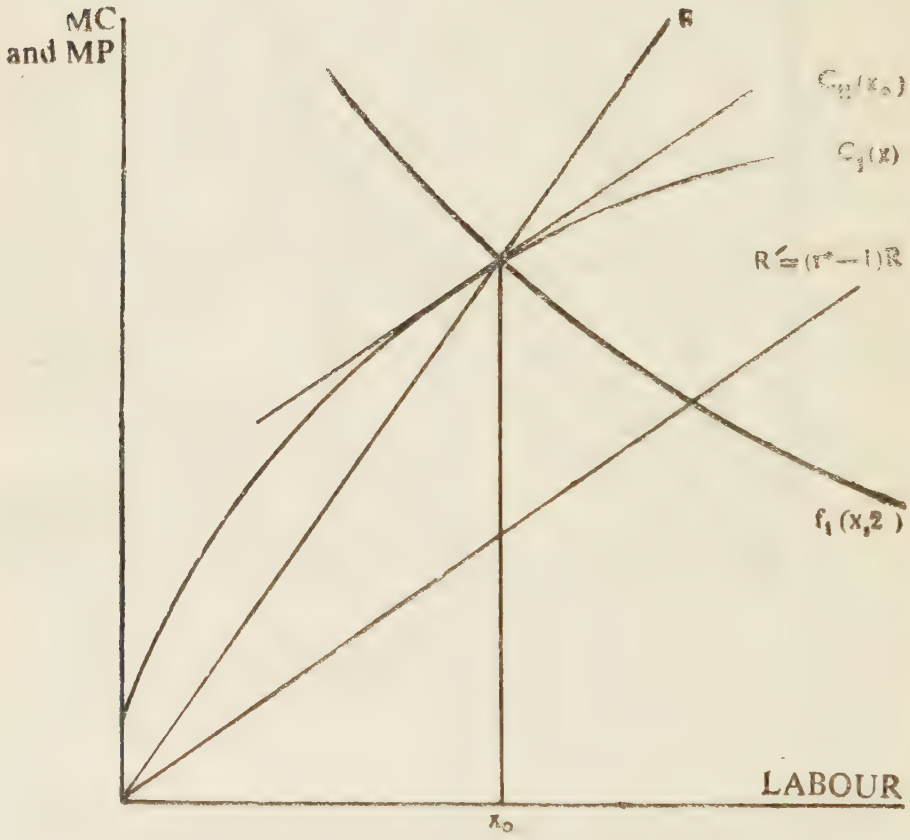


Figure 2

Here $C_1(x)$ is concave from below (i.e., $C_{111} < 0$), so that at x_0, $C_{11} < f_1/x$ as shown by the relative slopes of $C_1(x)$ and R. Multiplying the slope of R by

(r—1) implies a rotation (to the right for r—1 $<$ 1 or r $<$ 2) and clearly, since $C_{11} > 0$, there will exist some r* which will make the ray (r*—1) R parallel to the tangent to $C_1(x)$ at x_0. For any $r < r^*$, $(r-1)\frac{f_1}{x_0} < C_{11}(x_0)$.

Marginal compensation increasing at a decreasing rate is most unlikely to happen. If it happens at all, the decline of C_{11} will be very small and so C_{111} will also be very small. Now if $C_1(0)$ is small in value, r* will be very close to 2. Thus even in this unlikely and most unfavourable case, E $<$ 1 remains a definite possibility.

Case III b. $C_1(0) > 0$, $C_{111}(x) = 0$

Again $\frac{C_1(x_0)}{x_0} > C_{111}(x_0)$

and the conclusions of III a holds.

Case IV. $C_1(0) > 0$, $C_{111}(x) > 0$

Note that $\frac{C_1(0)}{x}$ is a monotonically decreasing function of x, which goes from infinity to zero as x goes from zero to infinity. On the other hand, it is obvious that C_{111} is not infinity at or near the origin but since $C_{111} > 0$, therefore as x goes from zero to infinity, $C_{111}[\alpha x]\,x$ also goes from zero to infinity. Hence there will be some value of x, call it x*, such that $\frac{C_1(0)}{x} - \frac{1}{2}C_{111}[\alpha x]x \gtreqless 0$ as $x \lesseqgtr x^*$

Clearly $\frac{C_1(x)}{x} \gtreqless C_{11}(x)$ as $\frac{C_1(0)}{x} - \frac{1}{2}C_{111}[\alpha x]x \gtreqless 0$ [from (2)]

Thus $\frac{C_1(x)}{x} \gtreqless C_{11}(x)$ as $x \lesseqgtr x^*$

Again there is some r* such that for all $r < r^*$, E is < 1.

For $x_0 < x^*$, $1 < r^* < 2$

For $x_0 = x^*$, $r^* = 2$

For $x_0 > x^*$, $r^* > 2$

---

[1] E $>$ 1 is impossible for r=1 even if $C_{11}=0$ (see pages 141—42 of Mr. Quibria's article), also E $<$ 1 is the only 'result' if r=1 and $C_{11} > 0$, therefore the assumptions of Mr. Rahman are sufficient and the question of assuming E $<$ 1 does not arise.

This is illustrated in Figure 3.

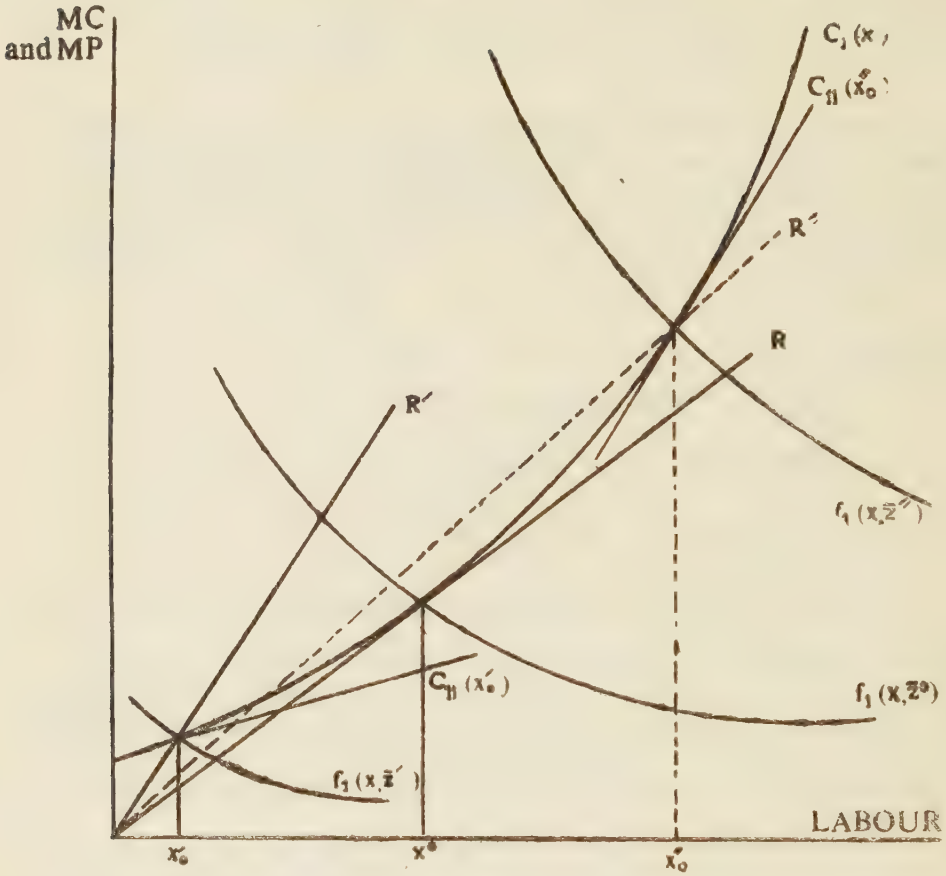


Figure 3

In the figure slope of R is $m \equiv \frac{f_1(x^*,\bar{z}^*)}{x^*} = \frac{C_1(x^*)}{x^*} = C_{11}(x^*)$

Hence for the farm size z^*, $E < 1$ for all $r < 2$.

Again at $x'_o < x^*$, $\frac{C_1(x)}{x} = \frac{f_1(x,\bar{z}')}{x} > C_{11}(x)$

and at $x''_o > x^*$, $\frac{C_1(x)}{x} = \frac{f_1(x,\bar{z}'')}{x} < C_{11}(x)$

obviously $z' < z^*$ and $z'' > z^*$. Therefore if z^* is the farm size

size for which $x_0 = x^*$, we may say that, given an increasing returns to scale production function with a scale factor $r < 2$, E will be < 1 for all farm sizes greater than or equal to z^*. Note that for a given marginal compensation function ($C_{11} > 0$, also $C_{111} > 0$), as $C_1(0)$ approcaches zero, x^* also approaches zero and in the limiting case x^* equals zero (Case I). $C_1(0)$ is no doubt very small. Hence x^* will be very close to zero or in other words farm size z^* will be small and so for most of the farm sizes our result is $E < 1$ if $r < 2$.

IV. CONCLUSIONS

If $C_{11} > 0$ and $r=1$, $E < 1$ is the only answer.[1] As the value of r increases E still remains less than 1 and at a higher value of r it may become equal to or greater than unity. Our analysis shows that for most of the cases $E < 1$ will occur if $r < 2$ and so $E > 1$ may happen if $r > 2$. But $r \geqq 2$ is not realistic. Empirical investigation have found that values of r equal to or greater than 2 are exceedingly r are (1,2,3, 4,5,6,9). Therefore we conclude, even for increasing returns to scale the most probable and realistic result is $E < 1$.

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A Measure of Local Development for Bangladesh

by

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An important component of a country's development, especially its rural development, is the growth of local services. This term refers to those "residentiary activities"—retail establishments, schools, health and local government services, and the like—that serve the everyday needs of the community or, in the case of East Pakistan,[1] the small county-like unit called the thana that functions as a composite community.[2] Although there is much more to a country's development than the growth of local services the level that these attain is a strong indication of the welfare levels of the families in the vicinity. Beyond that, local development is significant because it provides a context for entrepreneurship and a base for more complex activities.

In a country like Bangladesh, where new growth impulses may have been released, it seems useful to assess the level of local development as of some baseline date—in this case 1961—so that progress at a later date can be assessed. The East Pakistan census of 1961, which is the sole source of data for this analysis, is particularly appropriate for a baseline analysis because it reports the numbers of various institutional items that are normally omitted from censuses. That is, in addition to the conventional demographic statistics, it lists the presence of such things as hospitals, schools, and even historic monuments.

Thus, the aim of this paper is to measure a key dimension of organization of the 411 thanas of East Pakistan as of 1961 and show its distribution. It will

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[1]Since the data for this paper come from the East Pakistan census, we will frequently use that name when referring to the earlier period of Bangladesh history.

[2]The administrative structure of East Pakistan is multi-leveled. The organizational hierarchy from largest to smallest, is as follows (the accompanying numbers indicate the number of units at each level): Division (4), District (17), Subdivision (59), Thana (411). East Pakistan itself was a province of Pakistan.

also be shown that this measure is systematically related to significant validation criteria.

Construction of the Measure. The index of local development is based on a simple count of eight institutional items—primary schools, high schools, union democracy councils, telegraph offices, police stations, post offices, dispensaries, and tubewells—in each thana, as reported in the census. These items were chosen from among a number of institutions enumerated in the census on the basis of two criteria. First, they have face validity as indicators of local development; and secondly, they were found in preliminary factor analysis to form a single factor. An index formed by summing standardized scores (T scores)[3] for each of the selected items was used in preference to factor scores because we wished to keep the technical aspects of the analysis as simple as possible.

The actual index was constructed as follows. The raw counts of each component institution were converted to T scores, which were then summed to obtain the composite measure. Standardization by T scores serves to transform the raw distributions into a common metric so their sum is interpretable as a combination of "equivalent" things. The T score itself represents the distance, expressed in standard deviation units, from the mean of the distribution, which in each case has been set at 50.

A second consequence of this standardization procedure is that it automatically "weights" the items that form the index. In a composite of unstandardized items, the addition of an extra item of any type adds one point to the index score for a given thana (unless, of course, some arbitrary weighting scheme is devised). With standardization, however, the increment added to the score by an additional institution depends on the standard deviation of the original distribution. What this means in practice is that a frequently-occurring item will tend to add proportionally less to the total score than an institution which is found less frequently. Although this outcome is due purely to a mathematical artifact inherent in the standardization procedure, it is nevertheless consistent with the intuitive notion that relatively rare institutions should generally be weighted more heavily than more common ones.

Table I shows the means, ranges, and standard deviations of the local development index for the whole of East Pakistan, as well as for the four divisions. In general, the divisional means do not vary much from the country mean of 400. What does show up is a tendency for the ranges and standard deviations

[3]T-scoring is a standardization procedure which producres a distribution with a mean of 50 and a standard deviation of 10 [Edwards, pp. 158-59].

TABLE I

CHARACTERISTICS OF MEASURE OF THANA DEVELOPMENT, BY DIVISION

	Mean	Range	Std. Dev.
Rajshahi Division (113 thanas)	382	309—541	46.4
Khulna Division (88 thanas)	423	310—559	51.3
Dacca Division (106 thanas)	411	286—569	51.8
Chittagong Division (97 thanas)	388	293—563	66.0
All Divisions (404 thanas)*	400	286—569	56.4

*Although 411 thanas constitute the complete universe, data were missing for a few of them on certain items. The N's for this table represent the number of cases for which the complete set of institutional data was available.

to increase as one moves east. This trend probably reflects the marginal areas in the east, especially the Chittagong Hill Tracts, and the homogenizing influence of Calcutta in the west.

The best way to show that a local development measure such as this is a valid one is to clarify its causes and its effects, but such demonstration is beyond the scope of the available data. Short of that, it is possible to show correlations between the development index and related factors. If positive correlations are found and can be interpreted satisfactorily, the validity of the index is supported. At the very least, it can be shown to have a non-random character. Three such validating variables are thana population size, distance from Calcutta and historical monuments, as described below.

Population size is often considered to be synonymous with urbanization when, as in the present case, the unit is small and population density is high. And it is certainly true that a relationship typically holds between the number of people in an area and the number and variety of available services. Therefore, this variable should qualify as an acceptable validator. The mean thana population for East Pakistan in 1961 was 124,400 with a range from 14 to 366 thousands. The correlation with local development, as shown in Table II is '62. That

TABLE II

CORRELATION MATRIX OF LOCAL DEVELOPMENT WITH THREE VALIDATING VARIABLES

	1	2	3	4
1. Local development index		.62	-.41	.31
2. Population of thana			-.05	.11
3. Distance to Calcutta				.27
4. Number of historical monuments				

is a reasonably high relationship, considering the probable inaccuracies of the census. One the other hand, it is not so high as to indicate interchangeable measures, and the divergence of the two variables is not surprising considering that one is a group-level measure while the other is a count of people, of biological units, the number of which may or may not correspond to the level of institutional development.

Distance from Calcutta to the Geographic Center of the Subdivision. A map suitable for measuring distance from each thana was unavailable, so the next largest unit, the subdivision, was used as a basis for measurement. There are 59 subdivisions so this measure was considered sufficiently precise. Although Calcutta is located in another country, it has been the major port of the whole area for more than two centuries. Conceptually, this measure reflects a long tradition of theorizing about the effect of large cities on their hinterlands. Breese [2, pp. 38-43], Schultz [5] and Carrothers [3, pp. 94-102], to name a few, have all emphasized the benign effect of urban influence.[4] In the particular case of Calcutta, Van Suylichem [6, pp. 326-34] has documented the tremendous importance of this port for a hinterland that extends almost as far as New Delhi and to the east to the Burmese border. East Pakistan is well within this hinterland.

The correlation of the level of thana development to distance from Calcutta is -.41, a relationship that is high enough to substantiate the claim of a systematic relationship to thana development. There is a tendency, almost as if the earth were tilted as one moves away from Calcutta, for places close to Calcutta to have higer levels of development.

It may be objected that sheer distance is not sensitive to the many complexities of transportation in East Pakistan. Some quite distant places are functionally close to Calcutta if they have access to the sea. Conversely, thanas that are physically close to Calcutta may be functionally quite distant if they are frequently cut off by high water around them. It is certainly true that the transportation situation in this part of the world is complicated and unstable. And it must have changed over the many decades that have passed since the rise of Calcutta as a port. All the more reason, therefore, to use a very general measure of hinterland extent. Any attempt to weight distance by type of transport available

[4]Ahmad [1] argues that Calcutta had a stifling effect on local government in East Pakistan during the colonial period by undercutting the potential for ports such as Chittagong, but this fact would not negate our claim of a relationship. Even if the level of local development was abnormally low throughout East Pakistan, a relationship could still hold for proximity to Calcutta and a somewhat higher level of development as compared with the perpheral areas.

would amount to misplaced precision. If Calcutta has a general effect, it should show up as well or better with the kind of measure we have used as compared to one that is superficially more accurate.

Number of Monuments. The census reports this fact without explanation, and detailed informatoin on these objects is lacking. Evidently they consist of archaeological remains, of mosques built in earlier times, and in many places, of monuments erected to the memory of a large landowner by his kinsmen. According to informants who have lived in Bangladesh, the Department of Antiquities of the federal government is responsible for these monuments, but it is the district officer who supplies the counts, which he may inflate for one reason or another. Also, needless to say, there must be great variability in what is even considered a "historic monument". But it is likely that these kinds of errors average out over the 400 or more thanas, and in any event, if one finds a correlation the number of monuments and local development, it is all the more remarkable, given the existence of so much error. Thus, the correlation of .31 between the level of development and the number of historical monuments is all that can be expected.

The measure of distance from Calcutta involved some historical depth, but basically it was a spatial measure. The number of historical monuments is more obviously a measure of historical depth because whatever else these monuments represent, they are an accumulation from past institution-building. Social organization tends to generate physical artifacts, including the kinds of things that may be classified as monuments. So the statistical relationship may be viewed simply as the relationship between living and dead institutions.

Implications. The measure of local development presented here is based on readily available counts of institutions located in the thanas of East Pakistan as of 1961. Significant correlations with several validating variables indicate that it does in fact measure local development in a systematic way. One of these validating criteria was thana population size which was moderately strongly associated with the development index. Population size was less strongly related than the development index to the other two validators, distance to Calcutta and the number of historical monuments. Thus, the two variables appear to function differently.

Population size will probably continue to be used as a measure relevant to demographic and economic studies of district-like units but it is becoming increasingly inadequate as our understanding of the development process widens to include aspects of social organization. If development is more than having enough food for an ever increasing population, or the inputs for a fuctioning agricultural

system, then measures of institutional complexity will be increasingly useful. By their existence they pose the question of how comprehensive development can occur and be sustained.

As with any measure of development level, it becomes more useful if the amount of change can be calculated over ten or more years. Then the question of growth can be explicitly posed and associated changes in resource base, transportation, and, most importantly, relations with the central government, can be investigated. Such research lies in the future (although some have been reported in Young and Young [7], but measures of organizational development, based on readily available data, may contribute to such research.

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Book Reviews

Cost Benefit Analysis : A Case Study of the Ratnagiri Fisheries Project, by S.N. Mishra and John Beyer, Institute of Economic Growth, February 1976 (pp. xii+171, Price : Indian Rs. 35.00).

The study is an account of the cost-benefit approach to project evaluation made explicit by applying the technique to the specific case of the Ratnagiri Fisheries Project in the Maharashtra Province of India.

The study is divided into five chapters followed by seven appendices.

Chapter one gives us some basic information regarding the project covering some background information and how the project was appraised by the Maharashtra government. Then it argues how this appraisal failed to take account of the social costs and benefits and suggested some changes in the project on the basis of such social considerations.

In chapter two the geographical and resource characteristics of the project area, the project components and its various technical alternatives, the various costs at both private and public levels and finally the project benefits are discussed in great detail. The analysis of the benefit stream shows that the project formulators had overestimated the fish and prawn catch per trawler and the market price of prawns.

Chapter three presents the actual cost-benefit analysis of the project. Before the analysis is undertaken there is a lucid and "made-easy" discussion of the "social rate of discount" and the two alternative decision criteria, namely, the "Net Present Value" (NPV) criterion and the "Internal Rate of Return" (IRR) criterion. In the analysis proper, as the first exercise, the profitability of the project in the exact form as proposed by the project formulators (Maharashtra government) was calculated. In this form, the project promised an NPV of Rs. 53.93 lakhs at a 10% rate (assumed to be the social rate) of discount and an IRR of 30-31%. As the second exercise, the possible profitability of the project, after allowing for various modifications, was calculated. It was found that the modifications mainly affected the benefit stream. The modifications were regarding (i) the market prices of fish and (ii) the present and expected future catch per trawler. The modified result, therefore, stood at Rs. 23.07 lakh for the NPV and 17-18% for the IRR. Then, by stages, other considerations were incorporated into the analysis. Foreign exchange to be earned by the export of frozen

prawns were evaluated at the scarcity price, that is at Rs. 10.50 to the US. dollar as against the official price of Rs. 7.50 to the dollar. The accounting wage rate of unskilled labour was taken to be 80% of the market rates. As a result the NPV increased to Rs. 57.02 lakhs and the IRR worked out to be 26%. If to this the "regional income distribution benefit" is added the NPV further goes up to Rs. 63.20 lakhs. The corresponding IRR has not been calculated; its not understood why.

The next stage of the analysis incorporates some technical and implementation period phasing alternatives. It was found that a larger freezing plant at Ratnagiri and larger trawlers will make the project more profitable. If implementation period were cut from three years to one (which is technically feasible) the NPV would increase. Alternatively, if project implementation is postponed by four years, profitability is reduced.

Chapter four introduces uncertainty in the analysis. Uncertainty arises from possibilities of error in the basic data and from the fact that project benefits lie in the future. On the basis of sensitivity analysis, the average prawn catch, the shadow price of foreign exchange and the frozen prawn price turned out to be relatively more important variables compared to variables like the investment cost, fish catch and the price of fresh fish. After this breakdown, a probability distribution of each variable was estimated. The two usual methods, namely, the "potrait" and the "step-rectangular" methods of estimation were employed. Then using the six distributions for the six variables, (three of them sensitive and three relatively less sensitive) about 200 Monte Carlo simulations were done to yield a probability distribution for the IRR. From this distribution it was found that an IRR of 18.6% had the highest probability of occurance. The probability of the project yielding an IRR greater than the presumed social rate of discount (10%) was 88%.

In the last chapter, the necessity of looking at the private cost-benefit of the project, (as a whole and also by components because the different components are planned to be under different private parties) is argued about. The calculations show that the project as a whole promises high private profits. The analysis of components shows that the processing (freezing) plant promises 29-30% return while the trawlers promise only 9-10% return. The differential is caused mainly by high taxes on the engine, gear and fuel for the trawlers. Also the sales arrangements of prawn between trawlers and the processing plant are highly unfavourable to the former.

Appendices one through five present the tables for private and social costs and benefits of the several alternative versions of the project. We also get the

estimates of fish and prawn catch, their prices, the social rate of discount, the accounting price of foreign exchange and wage rate, the consumption distribution benefits and so on. Appendix six presents, briefly, the logic of the cost-benefit analysis and the computer programme used.

This book is an excellent paradigm of the proverb, "example is better than precept". The book does not discuss the technique of the cost-benefit analysis at the "high technical" level, but clarifies the issues involved by applying it to the case of the Ratnagiri Fisheries Project. From the book one can easily understand both the theory and the process of applying it in practice. The lucidity of the language is probably the most important reason for this. This makes it a very readable book even to the layman, for which, indeed, it is partly designed. But this does not mean that any of the rigour of the analysis is sacrificed. In consideration of the costs and benefits, particularly on the social side, the study is meticulous in the details; so much so that, such an amount of details would not be justified if evaluating the Ratnagiri Project was the only aim of the study. The fact that throwing light on the cost-benefit technique was an equally important aim, makes the details relevant and illuminating. The authors deserve sincere congratulations for being able to bring the subject to such beautiful grips.

Bangladesh Institute of Development Studies,
Dacca. **Quazi M.A. Malek**

Changes in Rice Farming in Selected Areas of Asia, by International Rice Research Institute, Los Banos, Laguna, Philippines, 1975 (pp. 377).

This volume is a collection of some informative studies on the diffusion and adoption of high yielding variety (HYV) rice in some selected areas of Asia. The collection covers 14 different areas of the continent, 5 in India, 2 in Indonesia, 4 in the Philippines and one each in Malayasia, Pakistan and Thailand respectively. A collection of agricultural economists and social scientist worked to produce the reports of different study areas. The volume consists of 18 main chapters. The chapters are as follows: an introductory chapter giving an idea about the set of questions the researchers had broadly in mind to investigate into, a chapter relating to identification of factors influencing the adoption of HYV rice, 14 chapters presenting reports of 14 study areas and finally a chapter on 'the social component of changes in rice farming'. The introductory chapter enlists broadly the aspects of investigation. They are the adoption rates of HYV rice, the obstacles to its adoption, the effects of new technology on the level

and the structure of employment and the socio-economic benefits of HYV technology on different income-groups respectively. The introductory chapter furnishes the reader with some basic socio-economic data of the study areas relating to farm size, family size, tenancy, acreage under rice, cropping intensity and the mode and the level of irrigation.

The second chapter deals in general with the obstacles to adoption. The types of obstacles ranges from techincal to non-technical factors or in other words, from non-availability of necessary inputs like fertilizer, pesticides, HYV seed, agricultural credit, marketing facilities to unfavourable structural factors like farm size and tenancy. Giving a general picture of the different study areas the chapter shows that availability of modern agricultural inputs has influenced the adoption to a great extent. On the basis of the available data, it is shown that the HYV technology cannot correct the inequalities of income distribution. On the contrary, it says that the situation with regard to income distribution may worsen with the adoption of HYV technology.

The following 14 chapters provide details of each of the study areas. Adoption of HYV rice has gone up in almost all the areas under study. The degree of adoption is however different in different areas. Adoption rates have been high in areas where modern agricultural inputs have been supplied regularly at subsidized rates and where a favourable relative price ratio has been maintained for HYV rice. The owner-farmers and the relatively big farmers gained more due to the adoption of HYV. Their higher gain or benefit is reflected in their rates of profit from rice cultivation.

This volume does not reflect very clearly on the socio-economic circumstances of a particular area and fails to indicate how the definite circumstances of that area affects adoption. Alternatively, it does not give definite idea how technology and institution are interacting, whether under given institutional set-up (which is a reflection of the asset-structure of the society) the new technology can be adopted by a large number of farmers. The approach to the problem of adoption of new rice technology has been more of a technical one.

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Institutional Change and Agricultural Wages in Bangladesh[1]

by

EDWARD J. CLAY*

I. THE PROBLEM STATED

Already in the 1960s there was evidence that the growth in the potentially employable rural labour force had been outpacing employment opportunities. It was found, for instance that between 1951 and 1961 additionals to the rural labour force were redundant with the existing capital stock and organisation of production [22, pp, 592-604]. Even so following the recovery from the Bengal Famine and Partition there was no significant trend in real agricultural wages but only large periodic fluctuations [10]. These fluctuations were associated mainly with weather induced variations in production. The price inelasticity of demand for rice, the basic food staple, leads to rapid and greater variations in food prices. The lagged adjustment in money wage levels thus leads to substantial short term fluctuations in real wages.

However, since 1971 the official statistical series for agricultural wages, when deflated by the consumer price index for agricultural labourers, or simply rice prices, show real wages falling to and remaining at levels unprecedented since the wage series were first published in 1949 (Table I) [4; 18]. A downward trend appears to be developing within the pattern of short term fluctuations in real wage rates. The record year for production of 1969/70 failed to bring real wages back up to the levels of 1963/64. The recent upsurge in production still leaves real wages in 1975 30% below 1969/70.[2]

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*The author is a member of the Bangladesh Agricultural Research Council, Dacca.

[1]This paper is a revised version of a paper given at the A/D/C Seminar on Technology and Factor Markets, held in Singapore, August 9th and 10th, 1976. It draws on the findings of a joint project combining crop cut experiments and a survey of harvesting operations being undertaken by the Cropping Systems and Agricultural Economics Divisions, BRRI. I would like to acknowledge my debt to Peter Hobbs and Zaidul Hoque who initiated the crop cuts, to Ekramul Ahsan, NI Miah and particularly to Nurul Islam Bhuiyan who conducted the survey with great sensitivity, coded and analysed the data. I would also like to thank the participants of the Factor Markets Workshop and members of staff at the universities of Minnesota and Wisconsin, Madison for valuable comments on earlier versions of this paper.

[2]The exponential trend in the real agricultural wage over 27 years is —0.73% with 0.10 level of significance :

$$\ln(\text{real wage})\ t = 0.7839 - 0.0073t;\ r^2 = 0.151;\ df = 22.$$
$$(13.99)\quad (1.98)$$

with trend t (1949=0) and 3 missing observations. See [18] for a more detailed discussion of the sources of official wage statistics. Figures in brackets underneath coefficients are t values.

TABLE I

AGRICULTURAL WAGES IN BANGLADESH

Year	Money Wage Takas/day	Index of Cost of Living 1953/54=100	Index of Real Wages 1949=100
1960	1.95	94.9	87
1961	2.18	95.9	96
1962	2.25	102.0	90
1963	2.41	102.2	100
1964	2.65	99.7	113
1965	2.34	105.4	94
1966	2.40	126.1	81
1967	2.60	135.3	81
1968	2.75	134.6	86
1969	3.12	140.3	94
1970	2.98	132.8	95
1971	3.15	n.a.	n.a.
1972	3.93	246.4	68
1973	5.59	351.5	67
1974	8.04	565.2	60
1975(p)	8.72 (p)	560 (p)	66 (p)

Source : [15].
Notes : P—provisional, own estimate.
n.a.—not available.

At the sectoral level, the evidence which is available on the growth of the rural work force and employment opportunities over the past decade is consistent with a longer term downward pressure on real wages. The rural work force has been estimated to be growing at not less than 3.2% per annum, with an annual increase in excess of 800 thousand [26]. Distress sales of land by those with the smallest holdings and partition of holdings into fragments too small to maintain the households without supplementary employment are additional factors also increasing the supply of agricultural labour [1; 18].

Turning to the demand side and the performance of the agricultural sector over the last twenty five years, it appears that the demand for the services of agricultural labour has in aggregate failed to keep pace with the growth of the potential labour supply. There is the evidence for the period 1951-61 that there was little net increase in the aggregate demand for agricultural labour [22,pp.592-604]. National income estimates show a fall in per capita value added in the agricultural sector since 1960/61 to 1969/70 [5], and since then output has stagnated. Then the components of agricultural growth since 1961/62 are such that the growth in demand for labour would be substantially less than the growth in output.

From 1961/62 to 1973/74 total cropped area increased by only 8% [2; 20]. The greater part of the increase in output, largely cereals production, has come through the introduction of irrigation, increased application of chemical fertilizer and dissemination of genetic improvements in rice and to a very limited extent wheat [4; 9]. The irrigated area is almost conterminous with the area of *boro* (winter) paddy cultivation which has increased by 190% over the last fifteen years. There has been a comparable increase in fertilizer consumption, again applied most intensively to *boro* pady. Official statistics indicate that between 15% and 20% of total rice area has come under new varieties introduced since 1965, including *pajam* and those of IRRI origin [20]. In addition the area under local improved varieties the product of genetic improvement and selection over the fifty years prior to 1965 has continued to expand with some modest level of fertilizer application.[3]

Micro studies of the impact of technical change on employment suggest that the whole package of irrigation, a new variety such as IR-8, and application of fertilizer at around 80 kg. per hectare increase employment by between 30% to 50% [3; 21; 23]. These are broadly similar to those reported elsewhere [11; 19] in the Indian subcontinent. This would imply on the most optimistic assumptions that the aggregate demand for agricultural wage labour has probably not expanded by more than 20% over the last decade whilst the labour force has been expanding by at least 3.2% a year.[4] These micro studies show that a substantial part of the increase in potential employment with the introduction of the package of new inputs is in periods of slack employment, in operations such as weeding rather than peak season operations such as harvesting or transplanting [3; 21].

These are circumstances in which one would expect some downward pressure on real agricultural wages. Even so, the magnitude of the fall in real wages indicated by sectoral wage data is so great in a society where the rural poor were already considered to be close to the nutritionally defined minimum level of subsistence. The remaining sections of this paper are devoted to

[3]The harvesting survey in the Joydebpur region from which data are presented below found that *nizersail*, an improved variety, had become the dominant transplanted (T) *aman* variety in that area by 1975. On the genetic improvements made over the period upto 1960 see [6].

[4]Assume that the full package of technical change has affected at most 20% of total cropped area expanding employment in aggregate by 40%. Meanwhile the cropped area has expanded by 8%. Then if there has been no reduction in employment on the other 80% of total cropped area, aggregate employment will have increased by only 17% in a decade in which the labour force has increased by between 35% - 40%.

exploring this process whereby agricultural wages could have fallen by 30% since the War of Independence and remained at this new low level since 1973.[5] The paper is organised as follows. Section II contains some observations on sources of data, methods of data collection and a few institutional aspects of the agricultural labour market in Bangladesh. Section III presents the findings of the study and analyses them. Section IV presents the summary and conclusions of the study.

II. PAYMENT SYSTEMS FOR PEAK SEASON AGRICULTURAL OPERATIONS

The traditional pattern of employment or underemployment in rural Bangladesh has been well established by micro studies of the annual ag icultural cycle [16; 21]. Even though there may be as much as 30% underemployment of the labour force over the whole year, there are critical peak periods of activity, land preparation for *aus* paddy and jute, transplanting and harvesting when the local labour force is fully employed. The labour force also may be temporarily augmented in these periods by villagers returning from urban areas [16], or established patterns of seasonal migration of labour to coastal *char*[6] lands, the *haors*[7] of Sylhet and the *baol* forest (Joydebpur) area north of Dacca, the location of the study reported below. In these seasons of labour scarcity labourers traditionally receive wages substantially in excess of day to day family subsistence requirements. In the case of harvesting the labourers received payment in kind, a fixed share of the harvested and threshed crop [17]. Similar traditional modes of payment for harvesting work have been reported elsewhere [8; 11; 13].[8]

---

[5]Some of the possible limitations of aggregate wages series such as that given in Table I are considered by Khan [18] and others will become more apparent in the light of succeeding discussion. Even so if these are regarded as providing only a broad qualitative measure of real wages, it is clear that in the past decade, and particularly the period since 1971, agricultural wages have plummetted to new low levels.

[6]*Char* : an area of land created by silt deposition in a river or estuarine channels. Many inland *chars* are subject to seasonal inundation and can only be cultivated in the dry winter season. Other deltaic and estuarine *chars* are cultivated through the monsoon season and harvested by seasonal movement of labour out to the *chars* in October and November. The 1970 cyclone resulted in such a high loss of life partly because large numbers of cultivators and labourers were out on the coastal *char* lands harvesting the rice crop [24].

[7]*Haor* : seasonally inundated techtonic depressions in the Sylhet region on which either a single *boro* or broadcast deepwater *aman* is cultivated. Holdings are large and production is probably constrained by peak draught and labour shortages in this little studied region.

[8]Similar traditional scales of payment are found for other operations at peak periods. For example farmers in Saharsa District, Bihar, told the author how labourers always expected three seers of grain a head for transplanting *aghani* (T *aman*) paddy. The labourers worked in groups, transplanting so many bundles and could complete two contracts in a day. With men and women working, and assuming an average consumption of 1/2 seer per head, one day's work would feed a family 2 adults and 2 children for six days. These half day contract rates were approximately one and a half times the full daily wage for weeding operations in 1970/71.

These modes of payment, with shares, sanctioned by custom, have been seen as exemplifying customary, patron client relationships [8], or as mechanisms for spreading poverty [14]. From the narrower economic viewpoint of farmers in a region such as the Joydebpur area, who maintained links with the same groups of labourers from a food deficit area such as Faridpur over many years, the relationship assures a guaranteed supply of labour for the peak periods of labour shortage.

From the view point of the labourer, these short period of high wages have enabled them to smooth consumption streams through the slack periods of underemployment that follow, both by storing or enabling them to build up consumption debts which can be paid off at harvest time.[9]

Where increased output is the consequence of investment in land improvement, irrigation, purchased inputs and genetic improvement in crops, and there is a fall in the labour output ratio,then the maintenance of these traditional modes of payment ensures for the labourers a substantial share in the benefits of increased land poductivity. The increase in average labour productivity also increases the attractiveness to the farmer of breaking these links between wage payments and average productivity. The impact of technical change on the real incomes of agricultural labour depends critically on how the institutional forms of the labour market respond to technical innovation [11].

Technical innovations which introduce new activities and new relationships, or which may be perceived as new, could provide an opportunity for institutional innovation. The changing organization of rice harvesting in Java may be an example of such a change [13]. If, however, traditional modes of payment reflect labour market supply and demand realities, then it is the dynamic relationship of demand for labour to the supply at peak periods of agricultural activity which would determine whether or not labour is able to acquire through an increase in real wages for peak season work a substantial share of the benefits of land augmenting technical change.

A study of harvesting operations was begun in late 1975 in the Joydebpur area north of Dacca to determine the levels of payment, modes of payment and income which labour is deriving from harvesting operations. This is an area in which there has been a substantial impact of new varieties, some irrigation and relatively intensive use of fertilizer in rice production. The results from the first season of this study provide some insights on the process of falling real wages which has been identified at a sectoral level.

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[9]These relationships have also been seen as providing a mechanism for extraction of surplus [7]. As migrant labour would not be bound by debts, in these cases the relationship would make more sense as one which guarantees a supply of labour and stabilises employment prospects.

III. RICE HARVESTING IN THE JOYDEBPUR AREA : THE AGRICULTURAL LABOUR MARKET IN TRANSITION[10]

The harvesting study involved regular crop cuts combined with a survey of farmers and labourers at the harvesting sites in four purposively selected locations in the Joydebpur area and commenced with the main transplanted *aman* (T *aman*) crop from November 1975 to January 1976. The survey showed that an improved local variety, *nizersail*, and new varieties, mainly *pajam* (*masori*), had largely replaced traditional varieties with the exception of *chandrasail* and the high quality *chinigura* variety that commands a substantial price premium. Yields of new varieties were substantially higher (Table II) but because of the preferred consumption characteristics of local varieties and a firming of harvest prices later in the harvesting period, when mostly the local varieties were being harvested, the harvest value of output was not significantly different.

The higher yields of new varieties were associated with greater labour use in harvesting operations, but the implied elasticity of demand for labour was only around 0.5 similar to the survey findings reported elsewhere [3; 21]. Therefore, although the new varieties with more intensive fertilizer application gave 42% higher mean yields than could traditional varieties, mean labour input was only 23% more (Table II).

TABLE II

YIELDS, LABOUR INPUT, IN HARVESTING AND THRESHING LOCAL AND NEW VARIETIES OF T AMAN PADDY[1]

Variety	No.of Obs.	Mean Paddy Yield (tonnes/ha)[2]	Harvesting (mean man-hours)	Threshing
1. New Varieties	114	3.27	195	119
2. Local Varieties	175	2.31	159	97
3. Ratio (1) / (2)		1.42	1.23	1.23

Notes : 1. Analysis of variance showed significant differences between labour requirements of new and local varieties, but not amongst new or local varieties. The variance is associated with significant differences in yields.

2. Yields are based on 5 x M^2 crop cuts made at the time of harvesting [12].

[10]The objectives, design and techniques of data collection and analysis adopted in this survey are described elsewhere [12]. The project combined crop cuts with survey of farmers and labourers at the harvesting site, thus eliminating recall data on yield assessment, and estimation of the labour force. Recall estimation is particularly susceptible to bias in the case of yields. Where farmers pay a share in kind and do not supervise, they have only a vague idea of how many labourers were harvesting.

Family labour carried out harvesting operations at 24% of crop cut sites. Otherwise harvesting was done by "local" labour or migrant "outside" labour. Three different modes of payment and a bewildering range of rates were found. The modes of payment included "traditional" share payments, daily wages with prepared food and fixed contract payments in cash, sometimes also with prepared food. These latter modes of payment are a recent innovation which is having a dramatic impact on the labour market.[11]

The payment of wages in cash and kind raises valuation problems. Labours receiving money wages spend most of their wage on foodgrains, largely low grade rice. The families of labourers who receive share wages, clean, husk, prepare and consume the wage good. Then if money is taken as the unit of account this may overvalue the wage when the wage good is a higher grade paddy. The labourer may appreciate the higher quality of the paddy but transaction costs also inhibit retrading of small amounts of paddy.[12] The fluctuations in paddy prices over the two months of this study also added to the problems of valuation. For these reasons two alternative units of account were used for estimating wages, the money equivalent at current market prices and a "paddy wage", the energy value of the wage in calories (Kcl) equivalent. This might be considered for standardize comparisons as providing limiting values within which lies the utility of the wage to the labour. The paddy wage can also be used as a crude measure of the real wage in cross section and time series comparisons of wage rates.[13]

These alternative methods of valuation produce quite different results. The energy value of the total payment to labour for harvesting and threshing is substantially higher in the case of the new varieties, 32% as against 15% than when measured in money terms. The mean wage per man-hour is also significantly higher for harvesting new varieties measured in energy terms, but no higher in money terms (Table III). Using these two methods of valuation, one cannot say that the real wages of labour per man-hour for harvesting are unambiguously higher in

[11]The traditional nature of share payments is confirmed by reports from the 1850s [17]. Discussions with farmers revealed that cash contracts and use of daily wage labour in harvesting have become common only in the period since 1971.

[12]The behaviour of agricultural labourers may be an example of a "flip flop" in consumer choice caused by transaction costs. The choice with respect to day-to-day consumption lead to a pattern of consumption different from what would occur if consumption streams could be planned over long periods. Almost every Bengali would prefer to consume local varieties of T *aman* if these were available at the same price as a coarser grade new varieties. These preferences are reflected in the 10-15% differential in prices between say IR-8 or IR-20 and *nizersail*. Therefore, farmers usually give coarse rice as prepared food. The labourers also buy low grade rice. However, given the transaction cost of retrading and the preferece for better quality rice, the situation arises of labourers using cash wages to purchase coarse grade paddy but consuming higher grade paddy which they receive as wage in kind.

[13]Where estimates of the energy expended in work are available the calory wage has the added advantage of providing a measure of the "net" wage which the labourer receives for agricultural work.

TABLE III

TOTAL PAYMENT TO LABOUR AND WAGE PER MAN-HOUR FOR HARVESTING AND THRESHING T AMAN PADDY

		New Varieties (1)	Local Varieties (2)	Ratio (1)/(2) (3)	F stat. (4)
1.	No. of Observations[1]	97	122		
2.	Mean Total Payment				
2.1	Money Value (Tks/ha)	384	335	1.15	4.90**
2.2	Energy Value (Kc1x10³/ha)	482	366	1.32	31.26**
3.	Mean Wage per Man-hour				
3.1	Money Value (Tks)	1.26	1.26	1.0	
3.2	Energy Value (Kc1x10³)	1.56	1.36	1.15	2.48*

Notes : 1. Include plots where only hired labour used for harvesting.
*Significance at 0.05 level with 1,217 df.
**Singnificance at 0.01 level with 1,217 df.

the case of higher yielding new varieties. A closer analysis of the relationship between modes of payment and labour payments shows that it is changes in the pattern of recruitment and mode of payment which are breaking the traditional link between labour income and output. The different modes of payment resulted in significant variations in both the total value of payments to labour and wage per man-hour measured in money or energy terms. This is allowing also for the higher labour input found where traditional share payments were made (Table IV).[14]

TABLE IV

TOTAL PAYMENT TO LABOUR AND WAGE PER MAN-HOUR FOR HARVESTING T AMAN BY MODE OF PAYMENT

Mode of Payment		Share (1)	Daily (2)	Contract (3)	F stat.
1.	No. of Observations	161	32	26	
2.	Mean Total Payment				
2.1	Money Value (Tks/ha)	376	310	295	11.76**
2.2	Energy Value (Kc1x10³/ha)	479	249	237	74.63**
3.	Mean Wage per Man-hour				
3.1	Money Value (Tks)	1.32	1.17	1.16	5.76**
3.2	Energy Value (Kc1x10³)	1.63	0.94	0.93	41.57**

Note : **Significance at 0.01 level.

[14]The survey failed to reveal a strong relationship between observed labour input and yield particularly in the case of use of contract hired labour. The combination of higher yields and the more generous traditional share contract may induce more labourers to work more intensively whereas the small contract labour groups working for a fixed wage have every incentive to finish quickly and move to their next contract.

In evaluating the impact of changes in the mode of payment on labour share and real wages, it is the relationship with yields rather than local or new varieties which is critical. No significant relationship was found between yields or value of output and the mode of payment adopted for harvesting. However, there is a significant difference between the modes of payment in the relationship between labour income and yields per hectare.

The introduction of daily wage or contract payments has weakened and nearly broken the link between labour income and yields (Table V). In the long

TABLE V

RELATIONSHIP BETWEEN LABOUR INCOME FOR HARVESTING AND THRESHING AND YIELD ACCORDING TO MODE OF PAYMENT[1]

	Mode of Payment	a_0	a_1	r^2	df Syx
1.	Money Value of Total Payment[2]				
1.1	Share	151.5	81.2	0.33	159
		(5.78)**	(8.86)**		80.2
1.2	Daily Wage	143.8	58.5	0.14	30
		(1.83)	(2.18)*		109.0
1.3	Contract	204.1	36.4	0.15	24
		(4.50)**	(2.09)*		66.9
2.	Energy Value of Total Payment[3]				
2.1	Share	75.7	145.6	0.54	159
		(2.47)*	(13.57)**		93.9
2.2	Daily Wage	105.8	50.4	0.16	30
		(1.70)	(2.37)*		86.4
2.3	Contract	165.2	28.7	0.16	24
		(4.71)**	(0.25)		51.8

Notes : 1. The relationship was tested by simple linear least squares

$$Y_1 = a_0 + a_1 X_1 + e_1$$

where Y_1 is the total payment to labour for harvesting and threshing per hectare for the plot and X_1 is yield in tonnes per hectare. Figures in brackets are t values.

* Significance at 5% level.

** Significance at 1% level.

2. Money value of wage measured in terms of Takas per hectare.
3. Energy value of total wage in terms of $Kc1x10^3$/ha.

run this has very serious implications for agricultural labour not only as increased production results from the introduction of modern inputs. Even at yield levels typical for local varieties with little or no application of chemical fertilizer, say 1.5 to 2.0 tonnes per hectare, total labour income from harvesting work is substantially less where share payments have been replaced with daily wage labour and the contract system (Figures 1 and 2).

THE RELATIONSHIP BETWEEN LABOUR PAYMENT FOR HARVESTING AND THRESHING T AMAN PADDY AND YIELD, JOYDEBPUR AREA, 1975/76

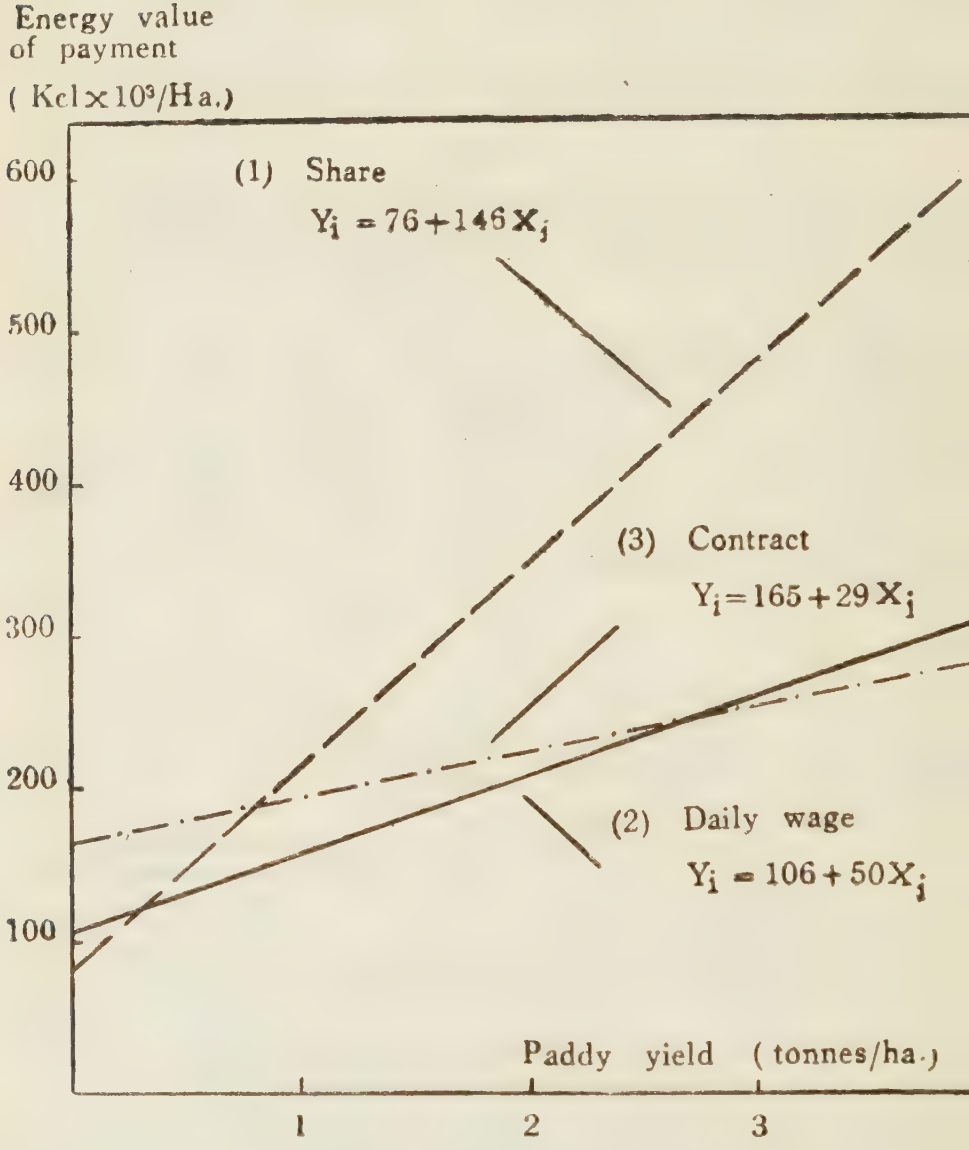


Figure 1

THE RELATIONSHIP BETWEEN LABOUR PAYMENT FOR HARVESTING AND THRESHING T AMAN PADDY AND YIELD, JOYDEBPUR AREA, 1975/76

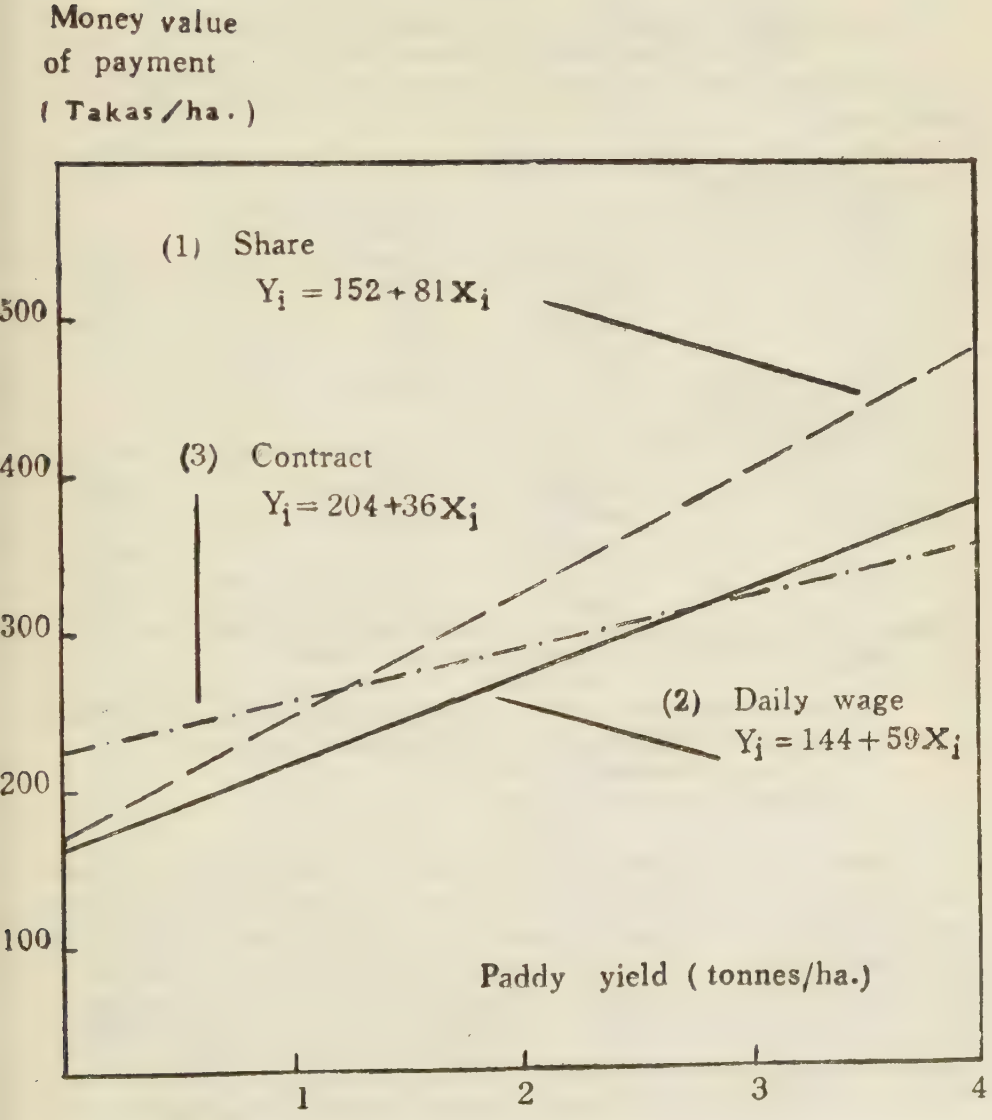


Figure 2

Under the traditional share system of payment where labour received a proportion of the crop which was fixed independently of output and the labour input elasticity is less than one, the real wage rate per man-hour is a positive function of yield. Inspite of the wide variations in share rates this remains true on the evidence of the Joydebpur data. However, the introduction of cash contracts and daily wages has also broken this link between wage rates and yields (Table VI).

TABLE VI

RELATIONSHIP BETWEEN WAGE PER MANHOUR FOR HARVESTING AND YIELD ACCORDING TO MODE OF PAYMENT[1]

Mode of Payment	a_0	a_1	r^2	df Syx
1. Money Value of Wage per Hour (Tks/hour)				
1.1 Share	0.963	0.120	0.035	159
	(6.76)**	(2.41)*		0.436
1.2 Daily Wage	1.051	0.042	0.037	30
	(9.10)**	(1.07)		0.160
1.3 Contract	1.198	—0.015	0.005	24
	(10.50)**	(0.33)		0.162
2. Energy Value of Wage per Hour ($Kc1x10^3$ per hour)				
2.1 Share	0.790	0.306	0.137	159
	(4.53)**	(5.03)**		0.534
2.2 Daily Wage	0.801	0.049	0.063	30
	(7.91)**	(1.41)		0.140
2.3 Contract	0.965	—0.012	0.005	24
	(9.98)**	(0.33)		0.143

Notes : 1. The relationship as tested by simple linear least squares

$$Y_1 = a_0 + a_1 x_1 + e_1$$

where y_1 is the wage per manhour for harvesting and threshing the ith plot and x_1 is the yield in tonnes per hectare. Figures in brackets are t values.

* Indicates significance at 5% level.

** Indicates significance at 1% level.

The use of contract groups and daily wage labour for harvesting is an innovation in the Joydebpur area which still only accounted for a minority of the crop cut sample of harvesting operations in the area. Who then were the innovators? The adoption of these new modes of payment was not found to be associated with yields (Table VII), or the adoption of other innovations such as new varieties, fertilizer or pesticides (Table VIII). Nor was there a higher proportion of larger farmers amongst these who had adopted the new modes of payment. However, a significantly higher proportion of sharecroppers continued to hire labour on the

TABLE VII

PADDY YIELDS AND VALUE OF OUTPUT MODE OF PAYMENT AND USE OF HIRED LABOUR IN HARVESTING T AMAN 1975/76[1]

Mode of Payment	No. of Obs.	Mean Yield[1] (ton/ha)	Mean Value of Output (Tks/ha)
Hired Labour Used :			
1. Share of Crop	161	2.77	4.90
2. Cash Wage	32	2.85	4.84
3. Contract Payment	26	2.50	4.58
(Total hired)	219	2.75	4.87
4. Family Labour only Used	70	2.49	4.08
5. Total	289	2.69	4.67

Notes : 1. See note 10 for explanation of method of collection and estimation.
2. In a partitioned one way ANOVA the yields and value of output were not significantly different as between modes of payment (1,2,3). However yields and value of output are significantly different at 1% level as between plots where hired labour was used and only family labour used (1,2,3,4).

TABLE VIII

INPUT USE AND MODE OF PAYMENT FOR HARVESTING ON SURVEYED PLOTS

Variety	Mode of Payment	Use of Inputs			
		Fertilizer not Used	Fertilizer Used	Fetilizer and Pesticide Used	Total
		i. No. of plots			
1. New	Share Payment	2	45	21	68
	Cash Payment	2	19	8	29
	Total	4	64	29	97
2. Local	Share Payment	6	77	10	93
	Cash Payment	2	25	2	29
	Total	8	102	12	122
		ii. % of column total			
1. New	Share Payment	50	70	72	70
	Cash Payment	50	30	28	30
	Total	100	100	100	100
2. Local	Share Payment	75	83	76	76
	Cash Payment	25	25	17	24
	Total	100	100	100	100

Note : Cash payment includes both cash contract and daily wage modes of payment but share includes only cases where labourers received a share of the crop. A Chi^2 test supports the null hypothesis of no relationship between input use or adoption of new varieties and mode of payment, p (Estimated $Chi^2 \leq 2.30$ with 6 df) > 0.10.

share system (Table IX). There are advantages for the sharecropper in making a share payment. As the final division of crop is frequently net of harvest payments in kind, a share payment shifts part of cost to the landlord. If the sharecropper joins in the harvesting, he also receives a harvesting wage as well as his share of net output.

TABLE IX

HOLDING SIZE, TENURIAL STATUS AND MODE OF PAYMENT FOR HARVESTING WORK ON SURVEYED PLOTS[1]

Mode of Payment by Tenure Group	Holding Size (ha)			
	1.0	1.0—1.9	2.0—	Total
	i. No. of plots			
1. **Sharecropper**				
Share Payment	14	14	16	44
Cash Payment	4	4		8
Total	18	18	16	52
2. **Owner Cultivator**				
Share Payment	31	40	46	117
Cash Payment	17	19	14	50
Total	48	59	60	167
	ii. % of holding size group			
1. **Sharecropper**				
Share Payment	78	78	100	85
Cash Payment	22	22		15
Total	100	100	100	100
2. **Owner Cultivator**				
Share Payment	65	68	77	70
Cash Payment	35	32	23	30
Total	100	100	100	100

Note : 1. Cash payment includes both cash contract or daily cash wage mode of payment, but share payment includes only cases where labourers received a share of the crop. A Chi^2 test supported the null hypothesis of no interrelationship between mode of payment and holding size of the cultivator but not the null hypothesis of no relationship between tenure status and mode of payment, p (Estimated $Chi^2 \leq 4.31$ with 1 df) < 0.05.

The adoption of the new modes of payment is most closely associated with the use of migrant labour and farm servants for harvesting operations (Table X). Whereas 90% village labour received a share of the crop, 40% of outside labour was hired on contract or paid a daily wage. Contract payment usually involved bands of seasonally migrant labourers. The daily wage labourers were typically

TABLE X

SOURCE OF HARVESTING LABOUR AND MODE OF PAYMENT ON T AMAN CROP CUT PLOTS

Source of Labour[1]	Share	Mode of Payment		
		Daily Wage	Contract	Total
	(No. of plots)			
1. Family with Hired Labour	10	18		28
2. Servants		6		6
3. Village Labour	109	6	4	119
4. Outside Labour	54	24	22	100
5. Total[1]	161	32	26	219

Note : 1. The categories are not mutually exclusive but show the occasions on which any of the categories of labour were found to be harvesting. For this reason the sum of columns may exceed the total (5).

one or two landless labourers who had migrated into the area in recent months. They temporarily attached themselves to farmers who had also allowed them to put up huts on their land.[15]

Even for a signle mode of payment, there was a wide variation in the wage rate. This is best exemplified by the occasions when groups were found harvesting within a hundred yards of each other and there was a 25% difference in the share being given. An attempt to identify the factors which lie behind such great variations in payments was partially successful. In a multiple regression analysis of the determinants of the size of share, it was found that the share is negatively related to yield, harvest price of the crop and the number of man-hours of labour input into harvesting and threshing.[16] However, these factors only account for a small proportion of the variance in the share (Table XI).

IV. SUMMARY AND CONCLUSIONS

As a provisional answer one is thrown back on emphasising that the situation is complex and in a state of transition. The chance contact with a mobile band of migrant labourers makes the market highly imperfect. Once there is a break

[15]These attached labourers are a similar group to those who are described in a study of a village close to Comilla as being responsible for bidding down the local wage rate [25].

[16]This may reflect the fact that on days when less work is available larger numbers of labourers combine and converge on the plot where harvesting work is available. The farmer is then able to offer a less generous rate with this favourable labour supply situation.

TABLE XI

DETERMINANTS OF HARVESTING SHARE PAID TO LABOUR

Constant	X_1	X_2	X_3	X_4	X_5	X_6	r^2	df
b_1	11.960	-0.483	0.587	-0.005	0.176	-0.001	0.077	155
t stat	(85.51)**	(2.05)*	(1.90)	(2.90)**	(0.56)	(2.33)*		

Notes : X_1=Labour share of crop paid for harvesting and threshing as % of gross yield.
X_2=Yield in tonnes per hectare.
X_3=Source of labour; from within village=0
from outside =1.
X_4=Man-hours per hectare in harvesting and threshing.
X_5=Tenure own land =0
sharecropped =1.
X_6=Harvest price of green paddy in Takas per tonne.
*Significance at 0.05 level.
**Significance at 0.01 level.

with the notion of a customary rate then factors such as location (how far the crop has to be carried), the balance of supply and demand on a particular day, the size of the plot, yield and its value in terms of quality characteristics, which are closely related to market price differentials, may all play a part. Some patron client relationships have been maintained as we found in the case of a few "traditional" migrants who had been harvesting for the same farmers for many seasons. This may be why in the case of share payments there is a positive relationship between size of the share and the labourers being outsiders (Table XI). These are all factors which are being more closely investigated in subsequent rounds of the survey. Even so at this stage it is possible to make some important generalisations on the basis of the findings of the initial round of the survey.

First, the structure of the labour market and payment systems are in a state of transition. There is a new source of labour, the migrant labour bidding down wage rates to find work. Many farmers are quite willing to accept this advantageous situation without regard to the problems of labour supply in the future or their relationships with local labourers. Second, the transition is associated with a change in modes of payment which in a cross sectional analysis is reducing the payments to labour below the level prevailing under the tridional payment system. When these changes are related to the preceding discussion of wage determination in periods of labour scarcity, the implications are extremely serious for the position of the rural poor in Bangladesh. The changing balance of supply and demand in the labour market is beginning to erode away the high peak season wages. This interpretation of events provides a simple and consistent if partial explanation for how real wages could have fallen so quickly in the past five years.

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Hand Pump Irrigation in Bangladesh

by

LAWRENCE M. HANNAH*

I. INTRODUCTION

In few nations of the world is increased food production as important as in Bangladesh where almost 80 million people live in the most crowded conditions on earth.[1] In 1974/75 over two million tons of foodgrain was imported which represents 20% of local production. Imports reached a peak of 30% in the worst year, 1972/73 [2, Table 1.3]. However, the country's natural endowment is rich in the inputs necessary for productive agriculture. Almost all of Bangladesh is a fertile deltaic plain suitable for intensive agriculture. Rainfall is concentrated in the monsoon months (May-October) but considerable surface water and ample supplies of groundwater are available for winter irrigation. Nevertheless not more than 15 per cent of the irrigable land is cropped in the *boro* season.[2] Most expansion of the irrigated acreage will have to come from groundwater development.

This paper has three broad objectives. First, it describes and enumerates the manually operated shallow tubewells for irrigation (MOSTI) presently in use in Bangladesh. Second, it assesses the distribution of benefits in terms of the land-holding of MOSTI users. Third, the implications of MOSTI adoption on credit programs, employment, cropping patterns and irrigation technology diffusion are also examined.

II. OVERVIEW OF MOSTI

Manually operated shallow tubewells for irrigation (MOSTI) is a relatively new but rapidly spreading form of irrigation technology in Bangladesh. A standard drinking water pump is located in the farmers field and used to provide irrigation

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[1]The density is approximately 1400 per square mile which is exceeded only by Singapore and Hong Kong.

[2]Groundwater availability estimates made by the IBRD concluded that 16 million acres or 75% of the cultivated land could be irrigated with groundwater.

water during the *boro* season.[3] Although some farmers have been practicing this method for up to five years the popular expansion and resulting attention have occurred mainly since the floods of 1974.

In almost all cases the technology is identical. A locally produced "Number 6" drinking water pump is connected with two twenty foot sections of $1\frac{1}{2}$" G.I. pipe and one or more brass strainers. The wells are sunk by local contractors using a sludger (manual percussion) method of drilling. All materials required are produced in Bangladesh with the current market price of one pump, two pipes, one strainer and installation being approximately Taka 1,000 in April 1976.[4]

The data for this paper was obtained from a survey undertaken by the Water Section of UNICEF in the spring of 1976. The purpose of the survey was to estimate the number of MOSTI in Bangladesh and to evaluate some aspects of a UNICEF MOSTI pilot project. Materials for 10,000 tubewells were purchased and made available to IRDP[5] for distribution under the UNICEF pilot project scheme. These tubewells were to be sold to cooperative members at approximately the actual cost to UNICEF. The precise terms were a total price of Taka 750, with a down payment of 25%, a second payment of 50% after six months (following the *boro* harvest) and a final instalment of 25% after one year.

According to the survey 9,200 of the 10,000 pilot project tubewells had been delivered to the cooperative associations in seven districts by the end of April 1976. Despite the late delivery of the tubewells, it is estimated that approximately 6,000 were sold and delivered this season.

As shown in Table I the survey identified 36, 061 MOSTI in place as of April 1976. These are located in 118 thanas of 14 distiricts from the more than 400 thanas in the 19 districts of Bangladesh. At least 180 thanas have been assessed as potentially suitable[6] for MOSTI application.

Just as MOSTI's rapid expansion was related, in large part, to the disaster conditions of the 1974 floods and the resulting food scarcity and high prices, some have argued that the attractiveness of the technique will fall dramatically with

[3]The precise benefits may vary considerably depending upon whether the MOSTI is used for primary irrigation of a *boro* crop or supplementary irrigation in the *aus* season. For a full discussion of this point see [7].

[4]The exchange rate in April 1976 was Taka 15=US $ 1.00.

[5]The Integrated Rural Development Program of the Government of Bangladesh.

[6]Defined as a good aquifer within 40 feet and a static water level of no more than 25 feet.

TABLE I

LOCATION OF MOSTI BY DISTRICT AS OF APRIL 1976

District	Number	Percentage
Dinajpur	816	2
Rangpur	2,665	7
Bogra	13,879	38
Rajshahi	984	3
Pabna	220	1
Kushtia	383	1
Jessore	257	1
Khulna	25	
Faridpur	2	
Dacca	2,060	6
Tangail	286	1
Mymensingh	12,954	36
Noakhali	30	
Chittagong	1,500	4
Total	**36,061**	**100%**

the relative price of rice. Let us briefly examine the possible linkage and relations involved. MOSTI returns may be affected by the rice price either on the output side, through the actual buying and selling of rice, or on the input side, primarily the cost of pumping labour. In general a rise in the price of rice will increase the value of the output, raising the attractiveness of MOSTI, but the price of labour will also increase reducing MOSTI returns. It is also reasonable to assume that the price of rice fluctuates to a much greater extent than the price of farm labour.

Considering the two characteristics of "market participation" and "pumping method" it is possible to rank the four combinations of high or low participation in the rice market and hired or self pumping. At one extreme the farmer who consumes all of his produce (low rice market participation) and who does his own pumping should be the least affected by a fall in the price of rice. A farmer who buys and sells grain on the market and hires his pumping labour would find that a decline in the rice price would reduce his income to a greater extent than his wage bill would fall. Thus the "high market participating" user who hires pumpers will be most inclined not to use MOSTI in times of falling rice prices. The case of "high market participation" and "self" pumping would be less affected than the previously discussed example and a farmer who consumes his rice but hires a pumper would be even less affected.

THE PRICE OF RICE AND MOSTI ATTRACTIVENESS

		Pumping Method	
		"self"	"hired"
Market Participation	"high"	A	B
	"low"	C	D

Figure 1

Types of MOSTI users as classified in Figure 1 can be ranked from the most affected due to a decline in the price of rice to the least affected. The ranking is: B, A, D, and C. In order to translate this ranking into a prediction about national behaviour in the face of falling rice prices, further research on the market participation aspect is required.

Although no empirical evidence is presented to "test" the usefulness of this "behavior framework" there is one aspect which must be kept in mind. We do know that much of the economic activity in rural Bangladesh takes place outside the cash market. However, it is assumed that relative values in that sphere do move in parallel with market prices and that the resulting impact would be in the same direction. An important limitation on the implications of these remarks is that those who adopted MOSTI in response to desperate famine conditions, rather than the "economic return" potential, may not respond to changes in the manner described this scheme.

TABLE II

MOSTI GROWTH BY YEAR

Year	New MOSTI	Total
1971		2,000
1972	6,000	8,000
1973	1,000	9,000
1974	6,000	15,000
1975	15,000	30,000
1976 (partial)	10,000	40,000

The sample survey of 501 MOSTI users shows an average command area of 1.6 bighas per well or approximately 20,000 acres this year. While that represents less than one tenth of one per cent of the agricultural land in Bangladesh,

it is about one per cent of the irrigated land in 1974/75 and 15 per cent of the area irrigated by groundwater in 1974/75.[7]

III. THE DISTRIBUTION OF BENEFITS

A sample of 501 MOSTI users was surveyed during March and April 1976. UNICEF Field Technicians filled in a one page questionnaire during an interview with a MOSTI farmer. The sample size was determined by interviewing twenty tubewell owners in each of the thanas included in the UNICEF MOSTI pilot program. The only instruction to the interviewer was that, "Tubewells checked should be representative of the entire thana".

TABLE III

LANDHOLDING OF MOSTI USERS

(Percentage)

Landholding (acres) (1)	UNICEF Survey			National Landowner-ship Distri-bution (5)	USAID Study (6)
	Private (2)	UNICEF (3)	Total (4)		
0 to 1	11	11	11	25	16.3
1 + to 2	15	16	16	22	
2 + to 3	10	14	12	17	32.4
3 + to 5	20	24	22	19	24.2
5 + to 7	10	15	12	8	12.1
7 + to 10	14	11	12	5	8.5
10 + to 20	15	9	12	4	5.6
20 +	5	0*	3	0*	1.0
Total	**100%**	**100%**	**100%**	**100%**	**100%**

Sources : [3; 9].

*Less than 0.5%.

Table III enables comparisons to be made for private and UNICEF wells within the survey as well as comparison with the national distribution of landholding and a study of MOSTI made by USAID. The proportion of MOSTI ownership is highest in the three to five acre class while national land ownership is a pyramid from the bottom up. An alternative way to express this is to compare the average MOSTI landholding of 5.76 acres to the national average landholding of 3.15 acres.

[7]According to the latest IBRD, BADC reports and an unpublished paper presented to the Bangladesh Economic Association Conference in March 1976 by Mujibur Rahman of the Planning Commission, during the 1974/75 season the acreage irrigated by various methods was Low Lift Pump (LLP)=1.296 million acres, Deep Tubewells (DTW)=.118 million acres, Shallow Tubewells (STW)=.023 million acres. Various surface and traditional methods are estimated at just over 1 million acres thus irrigated land=2.5 million acres approximately and groundwater area=DTW+STW=141,000 acres.

The tubewells purchased under the UNICEF pilot project appear to have reached smaller farmers than all other MOSTI. However when the UNICEF MOSTI are compared to the privately acquired MOSTI in the same year (see Table VI) the mean landholding is not significantly different.

The most interesting comparison is between MOSTI purchasers and users of other irrigation methods. M.F. Haque [5] reports an average landholding of users of shallow tubewell (STW), deep tubewell (DTW) and lowlift pump (LLP) of 9.23, 5.49 and 6.80 acres respectively. USAID reports better success in getting to small farmers with 73% owning less than 5 acres compared to only 60% in the UNICEF survey. A report prepared for SIDA/ILO [1] also contains information on landholding of irrigation users. In 1972 Thana Irrigation Program members owned an average of 6.66 acres. Case studies on five deep tubewells show an average holding of 5.09 acres.

A. Farouk [4, p. 77, Table C11] provides some data on the farmers receiving water from the huge Ganges-Kobadak Project. In the Ujangram district farmers obtaining water from the project possessed an average of 4.84 acres in contrast to only 1.80 acres for nonparticipants. The average landholding for all farmers in Ujangram was 3.69 acres. A recent article by M. Muqtada [8] contains a table of landholding for those farmers adopting high yield varieties during 1969/70. The average acreage for adoptors was 3.97.

It is not easy to make comparisons but the limited data available do permit some tentative conclusions to be drawn. All of the comparison data is subject to the qualification that it was not possible to reconstruct the method used to obtain the measures of landholding. In Table IV it can be seen that shallow tubewells

TABLE IV

COMPARISON OF LANDHOLDING FOR VARIOUS INNOVATIONS IN AGRICULTURE

	MOSTI	National	Haque			SIDA/ILO		Farouk	Muqtada
			STW	DTW	LLP	TIP	DTW	G-K	HYV
Average Acres	5.76	3.15	9.23	5.49	6.80	6.66	5.09	4.84	3.97

Source : See text.

are the only technology going to a group of farmers with a much higher average landholding than the average of all MOSTI surveyed. The Thana Irrigation Program and Low Lift Pump receivers are only slightly larger (15-18%) and the Deep Tubewells and Ganges-Kobadak farmers slightly smaller (5-16%) than the

owners of hand pumps for irrigation. High Yield Varieties were adopted by farmers holding 31% less land on average. While no definitive picture can be formed about MOSTI owners in relation to users of other agricultural technologies, the evidence does suggest that upto this time MOSTI has reached a similar group of farmers as defined by average landholding.

However, there are several reasons to believe that an expansion of MOSTI will progressively reach smaller farmers. High intensity use and recent acquisition of MOSTI are negatively related to average landholding (Tables V and VI).

TABLE V

LANDHOLDING OF MOSTI USERS BY THANA INTENSITY GROUP*

Landholding (acres)	Low	Medium	High
0 to 1	4%	11%	15%
1+ to 2	10	17	19
2+ to 3	9	14	14
3+ to 5	24	19	24
5+ to 7	18	10	9
7+ to 10	16	11	11
10+ to 20	13	15	7
20+	5	3	1
No Response	1		
Total	**100%**	**100%**	**100%**

*Low Intensity Group : 0-10 MOSTI per thana
Medium Intensity Group : 11-100 MOSTI per thana
High Intensity Group : 101 and more MOSTI per thana.

In part this is probably due to the higher attractiveness of MOSTI to farmers who principally consume their own produce and do not hire pumpers. The latter, according to our survey is a characteristic of smaller farmers. The high level of reliability or low risk associated with MOSTI compared to DTW and STW is also likely to be more important to smaller farmers who can less afford to lose a crop. If landholding were assumed to vary systematically among intensity groups, the MOSTI weighted average national landholding would be only 4.6 acres. This is well below other "technology receivers" reported in this paper. The current average and apparent trend in MOSTI user landholding assures an equal and probably better performance of MOSTI in reaching the target group of small farmers.

TABLE VI

LANDHOLDING BY YEAR OF PURCHASE

Number (%)

Land Holding (acres)	1976		1975	1974	1973	1972	Older	No Response	Total
	UNICEF IRDP	Others	All	All	All	All	All	All	
0+- 1	27(11)	15(11)	5(8)	3(16)		3(16)			53(11)
1+- 2	42(16)	11(16)	9(15)	2(11)	3(30)	6(31)	3(9)	4(10)	80(16)
2+- 3	35(14)	8(12)	5(8)	1(5)		1(5)	6(18)	7(17)	63(12)
3+- 5	62(24)	14(21)	16(27)	4(21)	1(10)	2(11)	5(15)	7(17)	111(22)
5+- 7	37(15)	6(9)	3(5)	2(11)	1(10)	3(16)	3(9)	4(10)	59(12)
7+-10	27(11)	5(7)	7(12)	4(21)	3(30)	3(16)	5(15)	8(20)	62(12)
10+-20	22(9)	5(7)	8(14)	3(16)	2(20)		7(21)	9(23)	56(12)
20+	1-	3(4)	5(8)			1(5)	3(9)		13(3)
No Response		1(2)	1(2)				1(3)	1(3)	4
Total	**253(100)**	**68(100)**	**59(100)**	**19(100)**	**10(100)**	**19(100)**	**33(100)**	**40(100)**	**501(100)**

When the data is sorted into three groups by the intensity or number of MOSTI per thana, a considerable difference in the distribution of landholding is apparent. High intensity is also related to the number of years since MOSTI was introduced. Table VI shows that medium or larger farmers are the first innovators or acceptors. As might be expected the high intensity thanas not only received the first MOSTI but also claim the largest number of current or recent installations. High intensity thanas have 34% owning less than 2 acres compared to 28% for "medium" and only 14% for "low". In Table VI 1976, 1975 and 1974 percentages with less than three acres are 41%, 31% and 32% respectively. USAID found a similar relationship between year of purchase and size of landholding.

IV. CREDIT

There is a common perception that small holders are in need of institutional credit and that its provision would improve their lot. The corollary is that an innovation such as MOSTI would be accessible to more of the smallest farmers if they could borrow to buy it. Although the data collected in this survey is not the best to enlighten us on this matter it is possible to compare purchasers who received credit under the UNICEF/IRDP program and those who purchased their tubewells privately in the same year. In Table VI there is no significant difference in the average landholding of these two groups. One possible argument as to why this is so is that any type of credit in rural Bangladesh is an implicit subsidy which assures some competition for it on the basis of power, wealth and influence.

Nevertheless it could be argued that the establishment of credit institutions and practices in the rural areas has a value in and of itself. This may be an independent objective which is conveniently and efficiently linked to the dissemination of a broad based technical innovation such as MOSTI.

V. EMPLOYMENT

If employment is considered as an independent objective, what is the impact of MOSTI? Since almost all of the pumping occurs at the traditionally slack time of year the absorption of idle labour should be a positive aspect of MOSTI. On average each pump requires approximately the full working time attention of one man. In many cases this input may be shared among several people including some hired labour. Thus the existing stock of MOSTI creates some 40,000 man-season jobs.

The surprising discovery in the assessment of the employment implications of MOSTI is related to degree to which hired labour is utilized. Fully 58% of the 501 farmers sampled hired a pumper to work with the family or to pump alone. USAID found an even larger proportion (69%) used some hired labour. Table VII illustrates these dimensions. The ranking of employment type from the lowest quantity of land ownership is : family, men only, family and hired, then hired only (see Table VIII). Table IX provides a full distribution of

TABLE VII

EMPLOYMENT FOR PUMPING

Men*	Family	Family+Hired	Hired	No Response	Total
134	43	180	112	32	501
27%	9%	36%	22%	6%	100%

*Men=the head of household or man only pumping, Family=man plus other members of family pumping.

TABLE VIII

SUMMARY OF LANDHOLDING WITHIN EACH EMPLOYMENT TYPE

Landholding (acres)	Men	Family	Family+Hired	Hired
0 - 2	36%	47%	23%	9%
2 - 5	44%	23%	38%	24%
5+	20%	30%	39%	67%
Total	**100%**	**100%**	**100%**	**100%**

TABLE IX

LANDHOLDING BY EMPLOYMENT TYPE

Landho ding (acres)	Men	Family	Family+Hired	Hired
0 to 1	13%	21%	8%	5%
1+ to 2	23	26	15	4
2+ to 3	18	2	15	8
3+ to 5	26	21	23	16
5+ to 7	11	5	14	13
7+ to 10	4	12	18	13
10+ to 20	4	5	5	33
20+		2	2	7
No Response		5		
Total	**100%**	**100%**	**100%**	**100%**

TABLE X

CROP TYPE OF MOSTI USER AT THE NATIONAL LEVEL

Rice	Wheat	Vegetables	Multiple	Other	No-Response	Total
86	2	1	3	4	4	100%

TABLE XI

CROP TYPE OF MOSTI USERS BY THANA INTENSITY GROUP

Intensity Group	Rice	Wheat	Vegetables	Multiple	Other	No Response	Total
Low	33	5	5	15	28	15	100%
Medium	49	6	5	15	22	3	100%
High	92	0	0	2	2	4	100%

landholding for each employment type. Clearly as a farmer becomes better off he tends to substitute hired labour for his own or that of his family.

At the national level 86% of MOSTI farmers surveyed were growing rice. Alternately 85.21% of the area irrigated by MOSTI was planted in rice. When the users are sorted by intensity of use within thanas there is a marked contrast between the 33% rice in "low" thanas and the 49% and 92% in "medium" and

"high" intensity thanas respectively. Unfortunately there are a number of factors which might help explain this for which we have no information. There may be ca es where one factor, for example soil type, makes both rice cultivation and irrigation unsuitable. Additionally since the data is tabulated in such a manner as to conceal the timing of MOSTI installation it is not possible to tell whether the larger proportion of rice cultivators in high intensity thanas is due to (a) many early users who grew rice and have not changed, (b) a shift to rice as the number of MOSTI increases, or (c) the massive introduction in these areas of many new wells all growing rice. Our data is consistent with almost any hypothesis about the effect of intensity or length of time MOSTI owned on choice of crop type. One factor which may have distorted our findings on this point is that UNICEF/IRDP MOSTI were distributed too late this year to enable a wheat crop to be planted. Since the sample contains fifty per cent UNICEF/IRDP MOSTI the cultivation of rice is likely to be considerably over represented and the cultivation of wheat to be under estimated.

MOSTI users from our sample appear to be growing a much larger proportion of rice than the national average. In the 1974/75 *boro* season only 52% of the cultivated areas was planted in rice.[8] The appropriate comparison would be with the cropping pattern on other irrigated land. Although no specific numbers are available the general impression is that a higher proportion of rice is cultivated. In contrast USAID found a much smaller proportion than this survey, only 69%, growing rice with hand pump irrigation.

VII. IRRIGATION TECHNOLOGY DIFFUSION

In addition to the immediate concern for delivering a technology to the smaller farmers there are other potentially advantageous features of MOSTI. First, the absence of a need for subsidy may make this a program which could be widely adopted in a short period of time without placing a great strain on the public resources of the nation. Second, there may be some technical or physical obstacles which limit the alternative investment possibilities at this time.

Government has heavily subsidized all types of irrigation other than traditional forms of using surface water. T.R. Islam [6] estimates the rate of subsidy to be 66%, 56%, 88% and 100% for LLP, STW, DTW and large scale surface

[8]This number was calculated by summing the reported acreage of *boro* rice and all reported crops known to be mainly grown in the winter season. One-third of the vegetable acreage was included. 1974/75 *boro* rice was reported 2.87 million acres of a total cultivated area that season of 5.57 million acres.

projects, respectively. MOSTI has an important advantage in that it requires no subsidy. This is a benefit in two ways. First the lack of subsidy means that limited government resources and the bureaucratic allocation process do not need to hinder the adoption of this technology. Second, it also takes out a great deal of the incentive for the large and influential farmers to "over use" the program.

The scale of hand pump irrigation also has some important implications for resource allocation and utilization. One of the most striking aspects of the existing irrigation facilities in Bangladesh is the low level of capacity utilization or small command areas. In the case of DTW the national average is only 30% to 50% of the technical potential. It appears that the savings which might have resulted from the economies of scale associated with larger projects are negated by this pervasive underutilization.

The obvious reason for some of these difficulties is the large number of farmers who must cooperate (50 or more) to fully utilize a DTW. The problem is not a simple unwillingness to work with others but the real issues of the difficulty of organizing common cropping patterns where the seasons overlap, a poor maintenance and service network, the high risk of pump failure or fuel shortage as well as a certain amount, of antisocial behaviour which has been reported on the part of some officials.

An intangible benefit of MOSTI expansion may occur in the form of "learning by doing". Farmers having a positive experience with MOSTI may be better able and more willing to undertake powered irrigation technologies when they are available in the future. Finally the pricing policy of a high rate of subsidy for other technologies does not encourage maximum capacity utilization. These aspects, when taken into account, add to the attractiveness of MOSTI both as a personal and a national investment.

VIII. SUMMARY AND CONCLUSIONS

The most important findings of this study are :

(1) There were more than 36,000 MOSTI being used in Bangladesh in 1975/76 *boro* season which irrigated about 20,000 acres or 15% of the area irrigated by other gound water technologies.

(2) MOSTI has been used for at least five years in Bangladesh.

(3) The present average landholding of a MOSTI farmer, while higher than the average national ownership, is approximately equal to the landholding of those participating in other irrigation schemes.

(4) A larger proportion of recently installed MOSTI are going to smaller farmers and there are reasons to believe that this trend will continue.

(5) In addition to the productive use of the MOSTI owner's time, more than one-half also hire pumpers, creating additional rural employment. The use of hired labour is directly related to farm size.

(6) A larger proportion of MOSTI farmers grow rice than the national average for the *boro* season.

(7) There may be important distributional and developmental reasons for promoting hand pump irrigation in Bangladesh.

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Money, Balance of Payments Theory, and the International Monetary Problem

by

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I. MONEY AND THE BALANCE OF PAYMENTS

In this section, we are concerned with a new approach to the theory of the balance of payments, the so-called "monetary approach", which has been developing and gaining popularity in recent years as an alternative to the "elasticity approach", the "absorption approach", and various other Keynesian approaches which may be termed "the foreign income multiplier approach" and "the Meade-Tinbergen Keynesian economic policy approach". (The meaning of these approaches will be explained more fully later.)

At the outset, it is important to note that the "monetary approach" is new only in the context of balance of payments theory as it has developed since the 1930s collapse of the liberal international economic order based on the gold standard system, and the accompanying "Keynesian revolution" in economic theory. It actually represents a return to the classical tradition of international monetary theory established by the work of David Hume and summarized in "the classical price-specie flow mechanism" of adjustment to international monetary disequilibria, and foreshadowed in the work of Isaac Gervaise, a tradition which has dominated international economics for the major part of the two centuries of existence of economics. It is important to make, and to emphasize this point,

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because the development of the monetary approach to the balance of payments has often been confused with something called "monetarism", to wit, one side of an argument about the conduct of domestic macro-economic policy management, mainly conducted in the United States though with a subsequent and derivative manifestation in the United Kingdom, between those who place their faith in fiscal policy--following the Hansenian American version of the Keynesian revolution—and those who—led but by no means dragooned by Milton Friedman—emphasize the necessity of proper monetary policy for the stabilization of the economy. The issue has been further confused by the fact that Robert Mundell and I, as the two most visible exponents of the new approach, happen to have been associated with the University of Chicago during the crucial period of its development, and hence are easily identified as lesser lights in the contemporary "Chicago School" led by Milton Friedman—even though both of us are Canadians by birth and citizenship, did our graduate work at Harvard and M.I.T. respectively, and were strongly influenced in our early professional years by the balance of payments theorizing of James Meade of the London School of Economics; and Mundell worked out his central ideas at the Johns Hopkins Bologna Center and the International Monetary Fund before he ever joined the Chicago department, whereas most of my own work on the subject was done during my periods at the London School of Economics in response to international monetary developments as seen from—more accurately, not understood by—the United Kingdom. Unfortunately, however, the description of scientific activity as a debate between visible and reasonable schools of thought, and the assignment of sceptics about prevailing orthodoxy to a ludicrous school through guilt by association, however tenuous geographically and intellectually, has become a hallmark of post-Keynesian discussion of monetary economics, and the ability to do it with fluency and plausibility assumed by many to be more than adequate to justify the earning of a Ph.D. at the public expense.

In order to explain the nature of the new approach, I find it convenient to begin with a brief history of the development of balance of payments theory, an *excursus* which will allow me to make some incidental digressions on the inherent difficulty of monetary theory and the shackles imposed on free theoretical enquiry in economics by the limitations of the tools -and particularly the mathematical tools—of theoretical analysis.

Hume's price-specie flow analysis was developed as an answer to the mercantilist contention that the way to augmentation of national wealth and power lay in the development and maintenance of a balance of payments surplus through measures to increase exports and decrease imports ("a policy of import substitution", in the modern phrase) so as to produce a continuing inflow of precious

metals ("treasure") into the country. Hume's analysis demonstrated that such a policy would inevitably be self-defeating, since the accumulation of money stocks would satiate the demand for them and any excess stocks would "leak out" through a balance of payments deficit. (Remember that in an open system actual stocks of real balances are adjusted to desired levels, not by price inflation or deflation as in a Patinkinian closed economy, but by outflow or inflow of nominal money through the balance of payments.)[1] In illustrating this proposition, incidentally, Hume employed a case parallel to the central policy problem case of the contemporary monetary approach, the expansion of issue of paper currency substitutes for precious metals, and showed that such an expansion would lead merely to an outflow of precious metals; the modern parallel is the proposition that excessive expansion of "domestic credit" by a country's banking system (under fixed exchange rates) will lead to a balance of payments deficit and a loss of international reserves. A corollary of Hume's analysis is the assertion that there is a "natural distribution" of the world money or reserve stock among the member countries of the world system, towards which the actual distribution will gravitate. (Note the parallel with the Archibald-and-Libpsey critique of Patinkin's first edition analysis of the effects of a disproportionately-distributed increase in nominal money.)

Hume's analysis was understandably related to the economic world of his time; but, such is the propensity of economists to prefer living with archaic old facts rather than open their eyes to new facts, the work of himself and his immediate successors left a permanent mark on balance of payments theory. The most important and pervasive was his concentration on the trade account—exports and imports of goods—as the locus of adjustment to international monetary disturbances. This has remained a valid point of complaint by practical men against academic balance of payments theory, especially as it has been carried over to and accentuated in the post-Keynesian "elasticities", multiplier, and policy approaches to the balance of payments. A second point, which—apart from some work by Ohlin in the 1920s—has only in the last four years begun to be questioned, has been the assumption incorporated in the phrase "price-specie-flow mechanism" that the domestic price level of a country possessing excess money stocks must rise relative to other countries' price levels before trade flows are affected and a balance of payments deficit emerges. This view assumes limited commodity stock-holding and long lags in transportation and the dissemination of information

[1] This proposition cleared monetary phenomena out of the way of policy discussion, and permitted the advocacy of free trade as the way to maximize output from national resources.

about markets, appropriate to Hume's time but a decreasingly realistic approximation for contemporary integrated world markets. Third, as already mentioned, Hume's account predated the development of large-scale commercial banking subject to control by a central bank; by this century, however, the theory had been extended by the addition of the textbook-standard analysis of the role of bank rate adjustments in stimulating short-term capital movements as substitutes for actual specie movements.

The classical Humean tradition of international monetary analysis, like so much else of value in the classical and neo-classical traditions of monetary theory, was swept aside and at least transiently completely suppressed in the wake of the Great Depression and the Keynesian Revolution. The fragility of that tradition, its vulnerability to attack by what purported to be "common sense", I attribute to the inherent difficulty of monetary theory. "Real" theory began with the notion that value is created by the expenditure of human effort over time, a notion that raises no real questions of understanding or ethical justification. But it ran into problems once it became necessary to explain the productive role of material capital and the existence of a return on it, problems which still and needlessly confuse, or are confused by, the present-day Cambridge successors of the English classical tradition. But real capital at least requires sacrifice to accumulate, and contributes in tangible form to total output. Money, on the other hand, is a stock which ultimately requires confidence, not tangible effort, to create, appears in its medium-of-exchange function as having no inherent usefulness, and yields no explicit return identifiable with an easily measurable contribution to production. Hence it requires a great deal of sophistication to treat it as a stock, requiring application of stock-flow adjustment mechanisms; and it is not surprising that even great monetary theorists like Wickesell and Keynes have found it more congenial to treat monetary adjustments proximately in terms of income-expenditure flow relationships motivated by the fixing of a disequilibrium relative price (the interest rate) through monetary policy, while politicians and the public prefer to think of balance of payments deficits being attributable to prices being too high, businessmen and workers too lazy, or governments too spendthrift with the taxpayers' money.

The classical approach to international monetary equilibrium and disequilibrium and balance of payments problems was swept away in the 1930s in favor of a succession of alternative approaches each of which attempted in its own way to treat balance of payments equilibria and disequilibria as flow equilibria, on the implicit or explicit assumption that flow trade deficits or surpluses (or in some cases surpluses or deficits on the balance of trade and services

accounts) entailed corresponding outward or inward flows of international reserves. This description, incidentally, encapsulates the two main grounds of objection to these approaches on behalf of the monetary approach. The first, which is one of those blindingly obvious elementary tautological points that economists are carefully trained to disregard in the process of formal model-building, is that (in a fixed exchange rate system) an excess demand for money can be supplied either by the acquisition of international money through the balance of payments surplus, or through the creation of money against domestic credit by the domestic monetary authority. This point has pervasive implications for international economic policy, which can be summarized in the proposition that no policy for improving the balance of payments can be successful unless supported by an appropriate restriction of domestic credit. The second point, understanding of which requires sophisticated understanding of the basic of stock-flow relationships and adjustments, encapsulatable in Don Patinkin's "real balance effect", is that a balance of payments deficit or surplus represents a transient stock-adjustment process evoked by an initial inequality of desired and actual money stocks, and cannot be treated as a continuing flow equilibrium. It is worth noting in passing that Keynes never made that mistake—he dealt entirely with a closed economy and a full stock and flow equilibrium in the goods, money, and bonds market. It was entirely a creation of others, who committed the error of analyzing a disaggregated monetary economy as if overall stock-flow equilibrium was enough, and continuing net cash flows between its (national) parts would leave other flow equilibria unchanged.

The first popular successor to the traditional framework of analysis that still prevails in official and popular policy discussions, was the so-called "elasticities approach", attributable to a classic essay by Joan Robinson [7], though traceable to early work by the eccentric Bickerdike. That approach was pre-Keynesian, in the direct tradition of Marshallian partial equilibrium analysis, which ignored repercussions of changes in production and expenditure in one sector on the equilibrium of the rest of the economy. Specifically, the approach regarded exports and imports as separate small sectors whose equilibria were determined by sector demand and supply functions in terms of domestic money prices (proxying for relative prices of traded goods in terms of domestic non-traded goods in general) as affected by the exchange rate applicable to conversion of domestic into foreign prices and vice versa. The approach had the advantage of apparently shedding light, mistakenly, it now appears, on two questions about exchange rate changes of contemporary concern apart from the effect on the balance of payments itself : the effect on domestic employment, improvement in the balance of payments in domestic currency (as distinct from foreign) increasing demand for domestic

output and the amount of employment; and the effect on the terms of trade, assumed to constitute an index of economic welfare. (In the latter connection, Joan Robinson and others attempted to establish a presumption where none can exist, to the effect that the terms of trade will tend to move against the devaluing country.) The approach had, however, three major drawbacks : first, by expressing the criteria for a devaluation to produce improvement in the trade balance in terms of separate elasticities for exports and for imports, in an unfamiliar formula making improvement depend in the simplest case on whether the demand elasticities summed to more or less their unity, it concealed the point that the question was one of market stability and concentrated attention on empirical guesswork as to what the magnitudes of the elasticities were likely to be in particular cases. Second, the analysis involved both the minor inelegance of ignoring cross-elasticity relations among exports and imports, and the major theoretical error—not, it should be recognized, an error committed by Joan Robinson, who clearly stated the multiplier implications, but an important error in popular interpretation of her analysis —of ignoring the multiplier implications of the increase in demand for domestic output that was the counterpart of an improvement in the balance of payments. In consequence of this error, less skilled theorists took the elasticities formulation as the total of the analysis, ignoring the question of availability of unemployed domestic resources to supply the successful-devaluation-induced increase in demand, and attempted to cram such consideration into the determination of the likely magnitudes of the elasticities themselves, in the early postwar controversy over elasticity pessimism versus elasticity optimism. Finally, as already mentioned, the model identified an excess flow demand for money with an excess flow demand for international reserves, thereby both treating balance of-payments disequilibria as continuing flow phenomena and ignoring the importance of domestic monetary policy in determining the effect of the presumed cash flow demand on the flow of international reserves.

The international economics application of Keynesian theory proper in the 1930s was primarily concerned with the international extension of the multiplier concept. Initially there was a controversy over whether the trade balance or total exports should be used as the multiplicant, and the marginal propensity to save or the sum of the marginal propensities to save and to import as the multiplier, a controversy soon resolved, correctly, in favor of total exports. Later work by Metzler and Machlup [4] was concerned with the question whether quality adjustments through the multiplier could fully replace the classical relative price adjustments, the answer being in the negative so long as both countries in the world system had positive marginal propensities to save internationally. A fully consistent multiplier analysis of the effects of devaluation had to wait until the postwar

period. The analysis was simplified by assuming perfectly elastic supplies of exports and imports and non-traded goods, so that devaluation involved essentially a change in the real relative price of the two goods, with this relative price change triggering multiplier expansion and contraction of income depending on whether the demand elasticities summed to more or less than unity and whether or not both marginal propensities to save internationally were positive. Since the two requirements appeared multiplicatively in the overall formula for the effects of a devaluation, and the concept of the marginal propensity to save disguised the fact that what was really represented was a bastard stock-flow concept of a marginal propensity to accumulate international reserves, it was easy to interpret it as making the effect of a devaluation depend essentially on the standard stability criterion, sum of the price elasticities of import demand greater than unity, and its result if successful a continuing inflow of international reserves (domestic credit policy being ignored).

Meanwhile, the fact that the immediate postwar situation was one of inflationary pressure rather than mass unemployment, which led most policy economists to attempt to torture the elasticities approach into conformity with inflationary conditions, led to the production by Sidney Alexander [1] of the rival "absorption approach" to devaluation. Alexander's essential contribution was to observe that, for a devaluation undertaken by itself under full employment conditions, the resulting extra inflationary pressure would make the elasticities of export and import demand and supply irrelevant, and the effect of the devaluation in reducing the deficit depend on the consequences of the inflation itself in reducing aggregate domestic demand for output. These effects were of two kinds : Keynesian effects working via various kinds of income redistribution, and of theoretically doubtful reliability, and the monetary-theoretic effect of inflation in reducing real balances. That analysis, while important in shifting attention from micro-economic elasticities to the macro-economic balance of aggregate demand and supply, was itself defective in two important respects, and is best regarded as constituting a halfway house to a correct analysis. The first important defect lay in taking devaluation by itself as a policy for analysis, under circumstances in which a combination of devaluation and deflationary macro-economic policy is clearly required. (It was James Meade's great contribution to reformulate Keynesian balance of payments analysis in terms of what policy-makers with several policy objectives in mind should do with the policy instruments at their command.) Second, the absorption approach still concentrates on expenditure flows, without recognizing either that a continuing deficit will eventually correct itself by reducing the economy's real balances, without devaluation being necessary, unless the balances are continually renewed by expansion of domestic credit to offset the effects of

reserve losses—in which case devaluation will not improve the balance of payments by deflating real balances.

The fourth, and most perfectly theoretically satisfactory, stage of post-Keynesian development of Keynesian balance of payments theory came almost simultaneously with the publication in 1951 of James Meade's *The Theory of International Economic Policy*, *Volume I*: *The Balance of Payment* [3]. Meade shifted the whole theory from the "positive" analysis of the effects of individual policies on the balance of payments to the "normative" analysis of the combination of policies the authorities must follow if they wish to implement policy objectives with respect to both domestic employment and the balance of payments ("internal balance" and "external balance", in Meade's terminology). Tinbergen's contribution, incidentally, was to show that the government must have as many independent policy instruments as it had objectives. Basically, Meade's analysis showed that the authorities must have fiscal or monetary policy to control aggregate domestic expenditure, and devaluation of controls over international trade and payments to control the allocation of domestic and foreign expenditure between domestic and foreign output. Note that insofar as the authorities maintained exact balance of payments equilibrium, actual and desired money holdings would balance and there would be no inconsistency with monetary-theoretic requirements. The only inconsistency that might arise would result from the implication that if government policy erred, the result would be a continuing flow-equilibrium deficit or surplus whose elimination would require a change in governmental economic policy.

The final stage of development of Keynesian balance of payments policy theory came with the apparent foreclosing of the possibility of using exchange rate change or trade and payments controls as policies for affecting the allocation of domestic and foreign demand between domestic and foreign output, and the recognition that the need for as many policy instruments as policy objectives could be met by exploitation of the fact that fiscal and monetary expansion have effects in the same direction on the current account but effects in opposite directions on the capital account of the balance of payments. This policy model—the so-called "theory of fiscal-monetary policy mix" [5]—also involved no monetary-theoretic inconsistency in cases of preservation of balance of payments equilibrium ; but it was correctly criticized for treating securities-portfolio stock adjustments in response to changes in international interest-rate differentials as continuing flow phenomena, and neglecting the consequences of such portfolio adjustments on the services account component of the current account. (Moreover, as a practical policy suggestion for the United States, it turned out to be a resounding failure to the extent that it was tried.)

The alternative "monetary approach" to the balance of payments starts from the proposition that balance of payments disequilibrium involves an inflow or outflow of international money, and hence must be treated as a monetary phenomenon requiring the application of the tools and concepts of monetary theory [2]. This, as mentioned earlier, involves two major changes in theoretical orientation and formulation. The first is the simple tautological point that domestic money can be either created or destroyed by domestic monetary policy operating on the volume of domestic credit extended by the banking system, or imported or exported by running a surplus or deficit on the other accounts of the balance of payments than the money account. (The phrasing here is carefully chosen, for a reason that will appear shortly.) This difference implies, most fundamentally, that balance of payments theory, analysis, and policy prescription must necessarily include exact specification of domestic monetary policy. The second and more subtle difference is that international money flows are a consequence of stock disequilibria differences between desired and actual stocks of international money---and as such are inherently transitory and self-correcting. This is, of course, nothing more than a contemporary restatement of the humeian price-specie flow mechanism, but one sophisticated by modern understanding of the nature of money as a stock yielding either utility to consumers or productive services to producers, and recognition of the possibility that adjustment of desired to actual stocks of international money may occur either through the trade account-surpluses or deficits on exports relative to imports of goods and services—or through the capital account—international capital flows of various descriptions— or both. In other words, the monetary approach frees balance of payments theory from its traditional concentration on balance of payments adjustment through changes in the trade balance, the modern equivalent of which is concern with the "basic balance" in the combined balance on goods, services and long-term capital accounts the last of these accounts being assumed for some reason to be more predictable and amenable to economic explanation and policy influence than movements in the money and short-term capital accounts.

The monetary approach also has the attraction of clarifying the role of movements in the terms of trade—the prices of imports relative to the prices of exports—in the process of international adjustment. Whereas prevailing theory has strongly implied that the purpose of devaluation is precisely to produce an adverse movement in the terms of trade (thereby making the devaluing government appear to be deliberately choosing to impose a national loss) and has further tended to suggest that reduction of material welfare consequent on devaluation can be avoided by alternative interventionist balance of payments policies, the monetary approach indicates that terms of trade changes—which may go in either direction in principle

—are either a transient feature of a monetary stock-adjustment process or a necessary concomitant of movement from an unsustainable deficit situation in which a country is "living beyond its income" with the help of distress monetary transfers from the rest of the world to a sustainable position of balance of payments equilibrium. In fact, recognition of this point has led monetary balance of payments theorists to transfer their analytical interest from models stressing imperfect substitution between foreign and domestic tradeable goods and the role of elasticities of demand for such goods in producing terms of trade changes that may go either way, to models stressing the distinction between traded international and nontraded domestic goods, the relative prices of which must change in a determinate and particular way as domestic expenditure varies relative to income in the process of international monetary stock adjustment (for an early example, see [8]). This clarification of the role of elasticities and relative price changes in the process of international adjustment is worth emphasizing, because the practice of monetary balance of payment theorists in concentrating analysis on the so-called "small country" assumption—that is, that the country under analysis is so small that all goods prices and interest rates can be treated as internationally fixed—has often been mistakenly interpreted to mean that the monetary approach is confined to the analysis of such trivial cases, though in fact the procedure has been prompted by the opposite purpose of clearing secondary and essentially trivial analytical complications out of the way of understanding of essentials.

Insofar as theoretical development in international economics is promoted by the observed failure of existing theories to fit the facts of experience, rather than by the refinement of professional standards of theoretical elegance and the instinct of scientific workmanship—a question on which historians of thought are deeply divided —the development of the monetary approach to balance of payments theory can be attributed to two recent historical events—the failure of the prevalent elasticity approach to account for a mounting accumulation of awkward failures of prescription and prediction with respect to devaluations and revaluations and other balance of payments policies, most notably the initial failure of the British devaluation of 1967 and its short-lived success after the British authorities turned temporarily to tight control of domestic credit expansion; and the failure of Keynesian theory to explain and account for the world inflation that has been going on since 1965 or so, a phenomenon that is easily explainable on classical Humeian lines by the generation of an excessive rate of world money supply growth initiated by United States monetary policy. Correspondingly, the ultimate test of the monetary approach is its superiority in empirical explanation of balance of payments phenomena. Work on the empirical testing of the theory has been proceeding apace behind the scenes though constantly impeded by the unfortunate institutional fact of life that the reputations of young economists can be made much

more quickly and definitively by more elegant and comprehensive mathematical theorizing than by the empirical testing of hypotheses. The main positive finds [2] so far have provided underpinning for the proposition that balance of payments improvement is inversely connected with domestic credit expansion, most robustly in the specific proposition that, contrary to Keynesian predictions, the fastest-growing countries will have the strongest (the surplus) balance of payments positions—because their demand for money will tend to grow faster than the supply of domestic credit. Empirical testing has, however, run into two major difficulties: the first is the dangerous temptation to test and confirm the monetary approach spuriously, by verifying statistically the tautology that an increase in domestic money must be provided either by domestic credit creation or by reserve acquisition. The second is that, in devising a proper test of the theory, which involves testing the existence and stability of the domestic demand for money, one runs into all the problems previously encountered in domestically-oriented research on the quantity theory of money, most noticeably the interdependence of demand and supply of money, lags in the adjustment of actual to desired quantities on both sides, and the division of the effects of monetary changes between price changes and output changes.

In concluding the Section, I should like to illustrate its point by applying the monetary approach to salient features of Israel's balance of payments problems, in a rough sort of way which is all that my somewhat casual and intermittent observations of the country's problems permit. The main points are fairly simple, and follow more or less directly from the Humeian tradition without the necessity of much if any elaboration of sophisticated monetary theory. They are that balance of payments difficulties are absolutely inevitable so long as the country lives or tries to live beyond its economic means—that is, to use more resources than are available to it by use of its own resources and capital inflows provided from abroad; and that the use of controls over the external trade and capital transactions will not only be of no longrun use—and shortrun shock effects from the adoption of hitherto unused and unexpected policy interventions must by now have worn out their usefulness in Israel—unless supported by an adequately restrictive monetary policy that would make them unnecessary, but will continue to be harmful in imposing unnecessary efficiency-reducing and resource-wasting costs on the economy. This generalization applies by extension to any efforts to keep the economy internationally competetive by means of one or another kind of incomes policy aimed at reducing or moderating domestic inflation. But an adequate discussion of the current inflation problem requires more detailed analysis of the present international monetary system of floating exchange rates, and more extensive discussion of it must be deferred to Section II.

II. THE INTERNATIONAL MONETARY PROBLEM

In Section I, I dealt with the application of monetary theory to the theory of the balance of payments, criticizing the successive stages of development of balance of payments theory since the early 1930s for their attempt to deal with the monetary phenomena of balance of payments surpluses and deficits with theoretical constructs designed to deal with a "real" or"barter" system, and outlining a new "monetary" approach to these problems—actually a restatement of the main tradition of international monetary theory going back to David Hume's formulation of "the price-specie flow mechanism" but improved by the incorporation of modern concepts of stock-flow adjustments in monetary equilibration processes. The fundamentals of the monetary approach involve two central points : the tautology that changes in the domestic money supply may be brought about either through changes in the volume of domestic credit or through inernational exchanges of international reserve money for goods or securities; and the proposition that a balance of payments deficit or surplus is a monetary phenomenon representing a process of adjustment of actual to desired stocks of money, and cannot therefore be appropriately treated as a continuing flow phenomenon representable as the residual of inflows and outflows of expenditure on goods (and possibly securities) governed by incomes and relative prices (and possibly relative interest rates).

In this Section, I turn from pure theory to the application of the monetary approach to a practical problem in international economic policy, the international monetary problem. The problem, in simple terms, is that the international monetary system of fixed but "flexible" exchange rates, created at Bretton Woods after international monetary collapse of the 1930s and centered on the International Monetary Fund, itself collapsed in February-March 1973 into a regime of "dirty" or "managed" floating exchange rates, while the official international monetary experts were still arguing in a rather leisurely fashion about the precise institutional changes required and negotiable to strengthen the International Monetary Fund system against certain weaknesses that had become increasingly evident from the early 1960s on. And the question is, very simply, what have we learned from the experience of collapse and its aftermath, and where do we go from here ?

I find it useful, in examining this question, to concentrate on the international monetary system as a monetary system, that is, a system governing monetary relationships among the constituent national members of the international economy, and to visualize the problems of an international monetary system based on the concept of fixed rates of exchange among national currencies in a very long historical perspective. That means starting, though very briefly, with the traditional

nineteenth-century gold standard—even though to speak of such a "traditional" system is in part mythological, since one of the safety-valves of the nineteenth-century system was that for most of the period nations had a choice between the gold and the silver standard, and opted gradually for the gold standard at their own convenience, the United States only coming firmly onto gold in 1900. (By the same token, the international experts of the League of Nations immediately after the First World War saw as one of the chief problems of re-establishing the gold standard in a world of many more independent nations the danger of a shortage of gold relative to the demand for it, and set themselves to propagandizing, largely unsuccessfully, for the adoption of the gold standard.)

The gold standard, in common with any other fixed-exchange rate system based either on a produced commodity or on an international credit instrument bearing a zero or uncommercially low rate of return, is subject to two major and interacting difficulties. The first is to provide for a rate of growth of the international reserve base money of the system approximately equal or closely related to the growth of demand or international reserves at stable prices, so that broadly full-employment growth of the world economy can occur at a stable, or only mildly rising or falling, world price level. Without such stable reserve growth, the fixed rate system provides, for its member countries, not monetary stability, but the obligation to experience roughly the same degree of price inflation or deflation as all the other members experience. The second arises from the fact that money derives its function, not from its inherent value or characteristics, but from confidence in its usability in exchange. Consequently, so long as the base money involves a functionally unnecessary investment of real resources or commitment to hold liquid assets in a zero or low-yielding form, there will be natural economic pressures to find higher-yielding substitutes for the holding of actual base money. This can be done with apparent safety so long as confidence is maintained in the ultimate convertibility of base-money substitutes into base money itself; but the result of the process is on the one hand greatly to complicate the problem of determining the rate of expansion of world base money appropriate to the maintenance of reasonable price stability, and on the other hand to make the system vulnerable to waves of excessive confidence and loss of confidence in the convertibility of base money substitutes into base money itself. These two difficulties, it may be noticed in passing, are precisely analogous to the problems encountered in the historical evolution of national central banking, which resulted in the conception of the central bank as having two not entirely consistent or easily combinable functions, that of controlling the growth of the money supply in the interests of monetary stability, and that of serving as lender of the last resort to the commercial banking system in times of liquidity crises. The solution in principle to the inconsistency, in Bagehot's famous phrase, was that in a liquidity

crisis the central bank should lend without stint, but lend at a penalty rate— so that excess money created in a crisis would be returned to the central bank as soon as possible and not remain to overhang the market.

The nineteenth-century gold standard solved these problems surprisingly well, thereby maintaining an international monetary climate conducive to liberal policies of international trade and investment and peaceful world economic growth. But the gold reserve standard re-established after the First World War very quickly fell victim to a collapse of confidence in national currency substitutes for nonexistent gold, triggered by the failure of the United States Federal Reserve System to prevent a collapse of the American money supply and complicated by intra- European national rivalries and American isolationism that prevented the salvaging of the system by international monetary co-operation. The system could have been rescued in three relatively painless alternative ways : co-ordinated national policies of domestic monetary expansion; international agreement to raise the national currency prices of gold; and the invention by international agreement of a new international credit reserve asset to replace gold. Failing the requisite willingness to solve the problem by international co-operation and invention, the only remaining alternative was the painful and socially disastrous one of lowering the national money and gold prices of commodities through savage deflation and its accompanying mass unemployment. (In fact, the 1930s ended with exchange rates among national currencies more or less what they had been at the beginning, but with the national currency prices some seventyfive per cent higher and national unemployment levels far higher on the average than the pre-war-I norm.)

The fundamental source of the problem in international monetary collapse was only imperfectly understood at the time; and, in accordance with what I said in Section I about the strong temptations for both 'practical' men and professional economists to retreat into the finding of "real" explanations and the proposal of "real" remedies for monetary problems, the monetary causation was increasingly dismissed or disregarded in favor of real explanations and remedies. Thus, the results of a failure of governmental monetary management were transmuted into evidence of the instability of capitalism and its alleged inherent tendencies to depression, and the failure to resort to expansionary monetary policy as evidence that monetary policy was powerless to make capitalism behave properly. The apotheosis of these ideas found expression in the American Hansenian version of Keynesianism, with its faith in the reality of "secular stagnation" and its emphasis on fiscal policy as the only effective tool available for macro-economic management. In the narrower context of international monetary organization, the experience gave rise to a number of ideas that constituted the ethos of opinion about

the problems that were intended to be solved by the Bretton Woods system. Chief among these were belief in the inherent "deflationary bias" of the gold standard, against which national full employment policies had to be protected by the freedom to devalue in cases of "fundamental disequilibrium"; fear of a chronic shortage of international liquidity, to be made good by international provision of credit substitutes for gold— a fear that dominated International Monetary Fund thinking well up into the 1970s, in spite of accelerating world inflation, and is still evident in the Fund's concern with providing additional short-term credit for consumer country victims of the oil-price escalation; belief in the need to exercise surveillance to prevent "competitive devaluation", together with "elasticity pessimism", both derived from misinterpretation of a situation in which general devaluation was required to raise the price of gold with one in which devaluation was required to correct individual deviant behavior in an international monetary system in overall equilibrium; and belief that the chief threat to the stability of the system was another great depression in the United States economy.

The related set of preconceptions and problem orientations naturally meant that official opinion was unprepared when, eventually, the chief problem of the system turned out to be world inflation rather than world depression. The 1930s problem was turned on its head: excessive liquidity, excessive willingness to accept U.S. dollars as credit substitutes for gold or Special Drawing Rights, "unfair" competition meaning reluctance to revalue rather than eagerness to devalue, and a chronic U.S. deficit as the engine of world inflation.

For a while, however, the Bretton Woods system worked well in providing a monetary framework for sustained economic growth and a trend towards a more liberal international trade and payments system. One must be careful, however, not to exaggerate how well it worked, and for how long. The European currencies only became convertible at the end of 1958, and tensions over the U.S. dollar glut and the adjustment of exchange rates began very soon thereafter; and the system was buoyed up for a long time after the war's end by U.S. belief that the U.S. had a disproportionate share of the world's gold and should if anything encourage a balance of payments deficit to relieve the postwar "dollar shortage" and redistribute the gold. Nevertheless, progress was being made in the mid-1960s with gradual acceptance of the view that the reserve currency position of the United States posed a special problem, and that the solution was gradual replacement of the dollar as international money by creation and steady augmentation of new genuinely international credit reserve assets in the form of Special Drawing Rights.

What forestalled this expected leisurely and deliberate progress towards a new, international-credit-based fixed exchange rate system was the decision of President Johnson in 1965 to escalate the war in Viet Nam, without introducing the substantial increase in taxes required to finance that escalation. The result was necessarily inflation, which was compounded by later inflationary mistakes of American monetary policy; and owing to the fixed exchange rate system and the dominance of the United States as reserve currency country and leading trading and investing country, the inflation permeated the world economy.

The period of inflation with fixed exchange rates raises two major problems for analysis. The first was why the major countries, primarily the European countries, were unable to cope with the American inflation. The International Monetary system did, after all, permit exchange rate changes in both directions, and it would have been possible in principle to confine most or all of the inflationary pressure to the United States by a series of revaluations of other countries' currencies against the dollar. This procedure would have been more disturbing than would the adoption of floating rates against the dollar, since it would have amounted to a speeded-up version of the crawling peg; but there had been enough discussion of the need for smaller and more frequent changes in the adjustable pegs after the 1967 devaluation of sterling to permit not too startling innovations. The main reasons were two. The first was that the European countries had got used to the idea of the dollar as a currency with a fairly stable real purchasing power, in relation to which they could adjust their currency values to take account of more or less inflationary domestic price trends than their major trading partners. American inflation deprived the system of this cornerstone of stability, and made it necessary to learn to cooperate in concerted revaluation actions against the dollar and American inflation—which they were unwilling and unable to do. The second reason was that the franc-mark realignment of 1969 dashed the hopes of the Common Market establishment, to the effect that the Common Agricultural Policy of the E.E.C. would make it impossible ever again to change the exchange rates of member countries on each other. The establishment reacted by pressing for the creation of a common European currency directly, rather than implicitly as an uncovenanted implication of the Common Agricultural Policy, beginning with the "snake in the tunnel" concept of narrowing the fluctuations of European currency rates in relation to each other, by comparison with fluctuations against the dollar. Given enough development of the necessary cooperation, this might eventually have produced a situation in which the European currencies could be revalued in common against the dollar, thus turning American inflation back onto the United States. But its main actual result was to freeze the exchange values of the European currencies and prevent individual action against world inflation. In

the end it was the United States, worried by its mounting balance of payments deficit, and especially the adverse trend of its merchandise trade balance, and not the Common Market countries, that forced a revaluation of other currencies in terms of the dollar (or, if one prefers, a devaluation of the dollar) in 1971. The Smithsonian agreement to this effect lasted barely long enough to let President Nixon win re-election, before an American decision to devalue by another ten per cent precipitated the collapse of the fixed exchange rate system into a regime of "dirty floating".

The second problem concerning this period was why governments, and official and academic economists, were so determined to deny the existence of a world inflation sparked by U.S. inflation and communicated by the fixed rate system. The requisite analysis was certainly obvious enough, in conformity with time-tested theory, and not entirely unknown from previous history, especially the well-known case of the effects of Spain's imports of precious metals from conquered Latin America. Yet all the official economists in Europe known to me rushed to present alleged statistical disproof of the contention advanced by myself and various colleagues in various European countries that the fundamental problem was a world inflation. The reasons seem to me, at this juncture, to lie in two basic defects of Keynesian monetary theory, or perhaps better vulgar post-Keynesian macro-economic policy theory, which those covinced of the rectitude of their position regard as a source of invincible strength against alternative "classical" monetary analysis. The first is that the General Theory provides no theory whatsoever about what determines money wages and changes in them. Consequently, when it comes to this question anything goes; and what goes best for the policy-maker accustomed to keep his brains sharp by reading the headlines and occasionally an editorial in his morning newspaper is a mishmash of *ad hoc* sociological analysis of union behavior, ending in the conclusion that what is required is an incomes policy. The second is that Keynesian theory, like income-expenditure theories in general, insists that monetary infleuences must influence aggregate output and prices through certain channels defined by the theory itself, and if the influence cannot be seen moving in the specified channels it does not exist. Thus, for a closed economy or one treated as closed, Keynesian theory asserts that monetary policy operates through influencing direct fixed investment—and this remains an article of faith even though econometrics has been remarkably unsuccessful in finding such an influence, and there is a growing body of evidence that monetary policy changes have a fairly reliable influence on consumption expenditure (in typical "Keynesian", not sharply inflationary, circumstances). For an open economy, Keynesian theory similarly insists that world inflation must be communicated either through an inflow of reserves, or through a sharp increase in the export

surplus—even though elementary monetary theory indicates that the money supply may increase either through reserve inflow or through domestic credit expansion designed to avert unwanted reserve infllow, and that arbitrage will tend to keep the prices of exports of closely substitutable goods in close alignment in the various supplier countries, rather than these prices having to be forced up by a prior increase in demand.

There is a third and related problem—why the very official sources that denied the reality of world inflation during the closing stages of the fixed exchange rate system, when it was a necessary implication of the fixed rate system, should have turned around within a few months of the switch to a floating rate system, which made participation in foreign inflation in principle unnecessary, to the position that there was indeed a world inflation whose manifestation in domestic inflation they were powerless to influence. It strains credulity—though not all the way to the breaking point—to hypothesize that it is a professional obligation of official economists to assert the exact opposite of prevailing economic truth, to give maximum scope for ingenious policy recommendations. But it seems plausible to hypothesize that, having tried unsuccessfully to hold back the tide of world inflation by sweeping vainly at it with the domestic brooms of fiscal, monetary and incomes policy, only to see inflation become an endemic problem arrestable only by thoroughgoing deflation and unemployment, governments and their economists found it easiest to blame the problem they had created for themselves on a foreign cause they could not be expected to be able to overcome.

Leaving that issue aside, the floating rate system, "dirty" or "managed" as it has been, especially in its early stages, has in my judgment worked very well. Contrary to the dire predictions of the adherents, defenders, and beneficiaries of fixed rates, and in accordance with the theoretical expectations of exponents of floating rates, the floating rate system has not led to the fragmentation of the world economy and the cessation of growth of international trade and investment. Early fears of such fragmentation, and particularly of proliferation of controls over international capital movements, were in fact connected with the initial European effort to maintain a common float against the dollar, and the belief of the French, since abandoned by them along with the common float, that this required a system of fixed rates for current account transactions and a floating rate for capital account transactions. Already, well before the oil crisis, the efficacy of the floating rate system had removed any urgency about fundamental international monetary reform; and the onslaught of the oil crisis produced the spectacle—unfortunately temporary—of former fixed rate diehards congratulating the world on its wisdom in having opted for a floating rate system.

Since those halcyon days of winter 1973/74, however, the fixed rate adherents and the commercial banking and financial community have begun once again to find grave fault with the floating rate system—though not as yet anywhere near to the point of recommending a return to fixed rates, but only to the point of recommending international cooperation and coordination in smoothing exchange rate movements. The criticisms are of two kinds, narrowly technical and broadly policy-evaluative.

The technical criticisms concern chiefly two matters : the magnitude of the exchange rate movements that have occurred, which are judged to have been excessive and erratic in relation to the adjustment necessary; and the failure of forward markets to develop for more than a few currencies, which greatly hampers the safe conduct of international financial business.

With respect to the first criticism, I must confess that I have always been astounded at the confidence with which "practical" men pass judgments about how much movement of a market price is sufficient to restore equilibrium. One would expect that, if the market consistently overshot, there would be vast profits to be made by currency speculation. But a number of "practical" bankers who have tried it have had their fingers badly and most embarrassingly burnt; and this is perfectly predictable from the results of economic research on forward exchange markets, using techniques taken over from analysis of the behavior of stock market prices, which show that, despite the frequent appearance of apparent purposive patterns of movement, the movement of foreign exchange rates in a free market is a "random walk". One must also note that foreign exchange markets, like stock markets, capitalize expected future price movements into current prices, so that prices may be expected to move more sharply in response to new information than consideration of current demands and supplies alone would lead one to expect. (To put this point another way, "practical" men are as guilty as the balance of payments theorists they criticize, of assuming that international adjustment occurs only through the current account.) In addition, one suspects that there is an important degree of optical illusion in bankers' discussions of the magnitudes of exchange rate changes. Financial attention tends automatically to concenrtrate on the rates between currencies that are important in international finance; but these are not necessarily the exchange rate relationships relevant to international trade and direct investment. Thus, for example, for the United States the Canadian dollar and Japanese yen rates are far more important than the rate on the Swiss franc; and the Canadian dollar has remained within a few cents of parity with the American dollar since 1970, whereas the yen rate has been fairly stable since 1973.

With respect to the second criticism, the failure of forward facilities to develop on the expected scale, this also raises some questions about what one can reasonably expect. To be brief and colloquial, it would obviously be pleasant for me if someone were to operate an all-night bar on the corner of my street, so that I could get a drink if ever I needed one; but I cannot reasonably expect anyone to open such a bar solely on the expectation of having me for a customer. Forward facilities in foreign exchange will similarly develop only if there is enough volume of business to yield a reasonably predictable profit; and it would not surprise me, given all the other risks to which private trade and investment are subject in the inflationary and oil-uncertain middle 1970s, if the establishment of futures markets in a broad range of currencies commanded a very low priority.

The policy-evaluative criticism of the floating rate system concentrates on the argument that the world has had more inflation, not less, since floating rates became the system of international monetary relationships. On this line of criticism, it should be remarked, first, that floating rate exponents have never argued that floating rates will guarantee more price stability than fixed rates. The original argument, which goes back to the 1930s depression, was that only with floating rates could a country pursue an independent employment and price stabilization policy. Actually, in that period countries did not in fact employ floating rates at all boldly for that purpose. Recently, the argument for floating rates has been inverted, quite logically, into the proposition that only with floating rates can a country pursue an independent price-stabilization policy if it so desires. Whether it chooses to do so, or on the contrary chooses to permit more inflation than would have been consistent with fixed rates, is a matter for its own political choice. And it is not surprising, given the head of steam that inflation was permitted to develop under the fixed rate system, and particularly the unusual degree of synchronization of the up phases of national business cycles and the consequent pressure of world demand on food prices in 1972/73, that countries should have opted to let inflation rip. There is, in fact, a dangerous parallelism of irrational interpretation building up in this connection : just as the defenders of fixed rates used to attribute the depression and the constriction of world trade of the 1930s to the 1930s floating rate regime—which relieved the worst of the horror—instead of to the predecessor fixed rate regime which produced them, so those currently hankering after a return to fixed rates are building towards laying the blame for world inflation on the 1970s floating rate regime, rather than on the predecessor fixed rate regime that made floating rates necessary.

Secondly, however, it is far too early to conclude that the floating rate regime is more inflationary than the predecessor fixed rate regime. The present world recession may, if contractionary monetary policies are not reversed too sharply

and expansively, succeed in breaking inflationary expectations and restoring rough price stability. And the determination to fight inflation, in the United States in particular, probably owes something to the effects of devaluation and downward flotation of the dollar in bottling American inflation up within the United States economy.

Time alone will tell. Meanwhile, it is certain that the world will not return to the fixed rate system, if it ever does, for a long time ahead. This raises some interesting problems for national economies and their policy-makers, as to how best to live with the floating rate regime. My own country, Canada, has chosen in my view the worst possible strategy—to stay virtually pegged to the American dollar, while letting the energy resources boom give the economy a still more inflationary impetus than pegging onto the U.S. dollar and the U.S. inflation alone would have done. It seems to me—and as in Section I, I speak with arrogance fortified by ignorance—that Israel has probably made a similar pessimum policy choice.

In an earlier run of the Horowitz Lectures, my Chicago colleague Milton Friedman surprised some of his audience, and later, of his readers, by recommending that Israel should abolish its central bank and instead peg irrevocably on the U.S. dollar. I agree entirely with Friedman's arguments for eliminating the temptations to inflation inherent in central banking in a small country anxious to promote economic development by joining irrevocably to a larger currency area; but I do not find it self-evidently axiomatic that the United States dollar is the proper currency to peg to. For a country significantly involved in trade with a number of countries, pegging to the currency of the most rapidly inflating country or (which may not be the same thing) the currency depreciating most rapidly in terms of the other major currencies, automatically guarantees the most rapid possible rate of domestic inflation. The only relevant argument for doing so—and it is a non-argument—is that a country heavily dependent on another for imported capital and unilateral transfers should peg onto the currency of that country in order to encourage investor confidence and maintain the domestic currency value of foreign gifts. The second objective makes no economic sense whatever—the real value of foreign gifts is what they can buy abroad—and the first makes no sense when the relevant risk is created by the irresponsibility of the investing country's and not the recipient country's financial management. To be concrete, if Israel as a small country finds it preferable to peg the Israeli pound on a larger foreign country's currency rather than floating independently, the question of whether to peg, say, on the German mark than the U.S. dollar should at least be looked at seriously.

I have said that, in my judgment, the regime of floating exchange rates is going to be with us for a long time. This raises the obvious question, whether eventually the world monetary system will return to a regime of fixed, or more likely "flexible" or "adjustably pegged", rates. My own hunch is that it will. One reason is historical: Britain after the Napoleonic War, the European countries after each of the two world wars, the United States after its period of floating (1860-1879), not to speak of lesser countries practicing currency flotation for shorter or longer periods, all returned sooner or later to fixed exchange rates. As an incidental point, worth meditating on and relevant in the event of another major war, note that, in contrast to a more distant past, the advent of the second world war led countries to peg the exchange rates of previously floating currencies, presumably to fix the unit of calculation for the external transactions of the controlled war economy. The other reason for my expectation is theoretical. The case for floating exchange rates is always carefully framed to distinguish between exchange rates that are free to move in response to market forces, and exchange rates that actually oscillate significantly over time. The point is under stable economic conditions and with stable national economic policies, rates free to move will actually change little and slowly over time. Such a situation of relative stability must come about, if only transiently, at some point of future time ; and with rates actually stable, it will seem a trivial step to make, well worth the additional benefits, from *de facto* to *de jure* fixity of exchange rates.

That possibility makes it more, and not less, necessary to keep fresh the memory of the intensive debates that were proceeding up until early 1974 (after the outbreak of the oil crisis) about the main lines that a reform of the international monetary system (conceived as a fixed rate system) should take. There are, specifically, three problems that are likely to be more difficult to get to grips with in the light of floating-rate and oil-crisis experience than they already were in the last phase of the International Monetary Fund system. One is the conditions under which exchange rate changes in both directions should be sanctioned and indeed internationally required— recall what I said earlier about the financial community's feeling that exchange rate trends in the past two years have been uncomfortably severe and erratic. The second concerns the future of the dollar as a nationally-created-and-controlled international reserve currency substitutable for and against Special Drawing rights under ill-defined and amorphous conditions. The third concerns the possible world central banking role of the International Monetary Fund. The prime function of a world central bank should be to provide stable growth of the international money base of the world financial system. But the International Monetary Fund has two serious distractions from this primary objective. One is its psychological domination, derived from its historical origins

in 1930s depression thinking, by the presumption that the main danger to be guarded against is a shortage of international liquidity. The other is its propensity, connected with its character as an at least partially democratically responsible world institution and its need to develop and maintain popular support among the numerical majority of its constituents, to concern itself with the lender-of-last resort function of the ultimate source of international credit, not only to the neglect of the money-supply-control function but to the nelgect of Bagehot's dictum that lending of last resort should be conducted at a penalty rate. It must obviously be demoralizing foı a central banking institution to be empowered, by virtue of low conventional lending rates in a period of rapid inflation, to lend at last resort at a negative real cost of borrowing to the borrow—and to be under political pressure to ration credit on the basis of borrower's need for real resources.

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An Exercise in Social Profitability Analysis : The Case of Ashuganj Fertilizer Project

by

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I. INTRODUCTION

Social profitability analysis of investment projects are increasingly coming into fashion in underdeveloped countries, and with good reasons too. Economists are agreed that 'private' or 'commercial' profitability considerations are inadequate for choice of public projects and may even given wrong signals. For example, we may be faced with the problem of choosing between two projects, one yielding milk as output and the other cigarettes. From purely commercial point of view cigarette producing project may appear to be more profitable, while from the social outlook milk producing project may be more desirable. In the absence of social profitability considerations, cigarette manufacturing project would be chosen.

There are a number of reasons for this divergence between commercial and social profitability. Firstly, more often than not public investment projects may involve outputs or benefits which are not readily marketable or even quantifiable. In our 'milk versus cigarette' example, in addition to quantity of milk as a direct benefit, we have 'improved health' as indirect benefit which is not taken into account in commercial profitability analysis.

Secondly, social costs of a project may be grossly misrepresented by the accountants cost figures. To go back to our previous example, 'health hazard' would feature as an important cost item for cigarette manufacturing project from the social point of view, but commercial profitability analysis would not take this into account. In addition, a number of items would represent costs from commercial point of view but not from the social angle. Such items are what we call "transfer payments".

These divergence between 'social cost and private cost' and between 'social benefit and private benefit', were noted long ago by the classical economists and are aspects of the more general problem of 'externality' [13].

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Problem of externality aside, valuation of cost and benefit items it terms of market prices has been thoroughly criticised in the literature. Due to various forms of 'market failures' market prices do not truly reflect social scarcities. This provides a third source of divergence between social and commercial profitability. Use of shadow or 'accounting' prices instead of market prices, for valuation of various scarce resources, is highly desirable for making sensible project choice.

Lastly, cost and benefit items are streams flowing over a number of years. For project selection these streams have to be reduced to a single number which may be called "net profitability". For this purpose we need a discount rate. The market rate of interest which is used for commercial profitability analysis would hardly do for social profitability calculations. What we need is a 'social discount rate' which would be different from the market rate of interest [17].

The present study is an attempt to apply the tools of cost benefit analysis in the case of a particular project—Ashuganj Fertilizer Project. The paper is divided into a number of sections. In Section II we have provided a brief description of the project. In Section III we have presented commercial profitability of the project. In Section IV we have conducted social profitability analysis, while in Section V we have done sensitivity analysis. Some concluding remarks have been made in the last section.

II. PROJECT DESCRIPTION[1]

The government of the People's Republic of Bangladesh has proposed to operate a new fertilizer factory at Ashuganj which is about 60 kilometer north-east of Dacca. The proposed factory would produce 'Urea' with Ammonia as an intermediate product. The factory would have a 925 metric tons per day (TPD) Ammonia unit and a 1600 tons per day (TPD) Urea unit. A new company named Ashuganj Fertilizer and Chemical Company (AFCC) has been set up to own and operate the plant. Until such time however, as the new company is adequately staffed Bangladesh Fertilizer, Chemical and Pharmaceutical Corporation (BFCPC) will be responsible for project execution.

Two main objectives of the project are (i) to produce nitrogen fertilizer at a low cost taking full advantage of Bangladeh's supply of natural gas; (ii) to eliminate the country's dependence on foreign source of nitrogen fertilizer supply and thereby reduce the existing pressure on Bangladesh's scarce foreign exchange supply.

[1]Data and other basic information about the project are based on a Report prepared by I.B.R.D.

BFCPC after making a careful examination of six possible project sites has chosen a location on the eastern bank of river Meghna near Ashuganj. The chosen site, it is claimed, has the following advantages :

(a) Central location with reference to possible market centres.

(b) Easy access to other parts of the country via rail and riverways.

(c) The chief raw material—natural gas would be supplied by Titas Gas field which is only 12 km. away.

(d) Power supply can be obtained from Ashuganj Power Plant which is only 2 km. off the chosen location.

(e) Water for cooling, processing and drinking may be arranged from the adjacent Meghna river.

The only disadvantage, it is reported, is that the site would require considerable earth filling.

It is estimated that the project would cost about US $ 249.0 ml. equivalent with a foreign exchange component of US $ 142.0 ml. The foregin exchange component would be financed by a number of foreign sources. Local currency cost component equivalent of US $ 107.0 ml. will be met by the government's own funds as equity. Appendix Table I gives a breakdown of the total project cost disaggregated into local and foreign exchange components. Project construction would involve a four year period (1974 to 1978). In Appendix Table II we have a year-wise flow of project construction cost disaggregated once again into local and foreign exchange components.

III. COMMERCIAL PROFITABILITY ANALYSIS

As a commercial enterprise AFCC would be interested in maximising its own private profits. Estimated income statement for the entire project life is presented in Appendix Table III. The project is expected to go into production from 1978 with 50% capacity utilization in the initial year increasing to 90% in 1980. The project life is estimated to be 12 years (mid 1978 to mid 1990). Depreciation is calculated on a 12 year straight line basis. In Table I net private profit flow (benefit minus cost) is presented. Various values of discount rate are used—values being converted into 1974 terms. Net present value (NPV) decreases from 1297.75 ml. Tk. at 5% discount rate to 72.26 ml. Tk. at 10% discount rate. It becomes negative (-92.78 ml. Tk.) at 11% discount rate. Internal rate of return (I/R/R) is approximated by interpolation. It turns out to be around 10.56%. Whatever investment criteria we follow (our own bias is towards NPV criteria), it is clear that a rather low rate of interest would induce a private producer to

undertake this project. In the same light, based on commercial profitability considerations the government will undertake this project only if the social discount rate is substantially low. Further, under limitations of investible funds the project would be ranked low in the list of priorities.

TABLE I

STREAM OF COST AND BENEFIT : COMMERCIAL PROFITABILITY OF AFP

(U.S. $ 1.00=Tk. 15.00) (in million Taka)

Year	(Benefit-Cost) Net Profit	Discount Factor at 5% i=0.05	Net Present Value at 5% d/r	Discount Factor at 10% i=0.10	Net Present Value at 10% d/r	Discount Factor at 11% i=0.11	Net present Value at 11% d/r
		(1+i)=1.05		(1+i)=1.10		(1+i)=1.11	
1975	—481.50	1.05	—458.57	1.10	—437.73	1.11	—433.78
1976	—1119.00	1.10	—1017.27	1.21	—924.79	1.23	—909.76
1977	—1279.50	1.16	—1103.02	1.33	—962.03	1.37	—933.94
1978	—446.85	1.22	—366.27	1.46	—306.06	1.52	—293.98
1979	—583.35	1.28	455.74	1.61	362.33	1.69	345.18
1980	615.45	1.34	459.29	1.77	347.71	1.88	327.37
1981	603.60	1.41	428.09	1.95	309.54	2.09	288.80
1982	591.90	1.48	399.93	2.15	275.30	2.32	255.13
1983	580.20	1.55	374.32	2.37	244.81	2.58	224.88
1984	568.50	1.63	348.77	2.61	217.82	2.86	198.78
1985	556.65	1.71	325.53	2.87	193.95	3.17	175.60
1986	544.95	1.80	302.75	3.16	172.45	3.52	154.82
1987	533.25	1.89	282.14	3.48	153.23	3.91	136.38
1988	521.55	1.98	263.41	3.83	136.17	4.34	120.17
1989	509.85	2.08	245.12	4.21	121.10	4.82	105.78
1990	253.50	2.18	116.28	4.63	54.75	5.35	47.38
1990	526.50	2.18	241.51	4.63	113.71	5.35	98.41
			1297.75		**72.26**		**—92.78**

Interpolation of I/R/R :

$$I/R/R=0.10+0.01\left(\frac{92.78}{72.26+92.78}\right)=0.1056=10.56\%$$

IV. SOCIAL PROFITABILITY ANALYSIS[2]

The first task is to lay down the objective function. A project may involve a number of objectives such as maximising aggregate consumption, employment objective, redistribution objective and so on. In such cases net aggregate project

[2]In the discussion that follows we have made liberal use of the UNIDO guidelines [17].

benefit would be a weighted sum of the various types of benefits. For our present analysis we shall assume that the government is interested in maximising aggregate consumption.[3]

The next step would be to identify costs and benefits due to the project. When we talk of 'cost' in social profitability analysis we imply 'opportunity cost'. To illustrate this concept, suppose an individual goes to a football match. What is his opportunity cost ? One answer is, the amount of money spent for ticket and transport plus the value of time spent at the football match which the individual could have spent otherwise, say reading books. However, reading books is not the only alternative. He can list a number of other activities in which he could have devoted his time. The relevant cost is therefore the value of benefit he sacrifices from his 'next best course of action'. Thus 'maximum benefit foregone' due to a certain course of action is the opportunity cost of that action. Social costs of the project have to be viewed in this light.

The nature of foreign loan needs some explanation. When foreign loan is 'tied' to a project (i.e., the loan would not be available in the absence of the project) the amount of the loan itself would not figure as a cost item from social point of view. This is because we are using cost in the 'opportunity cost' sense and in the case of tied loans the opportunity cost of using the loan is zero since we are not depriving some other possible project from its use. For our project at hand, the loan is untied. Note, however, that repayment of loan is not considered as a cost item for the loan would have to be repaid even if this particular project is not undertaken.

The cost of land is similarly determined—loss of maximum benefit due to use of land for this project. As noted earlier, the proposed site for Ashuganj Fertilizer project would require considerable earth filling. Perhaps due to this reason the land has been left unused. Hence the opportunity cost of land is zero. Actual payment for the acquired land would therefore feature as a transfer payment. It is a cost to the corporate sector but a benefit for the government.

An important distinction between private and social cost is that in the case of the latter a number of expenditure items incurred due to the project represent 'transfer payments'. They are costs from the private point of view but not from society's view point. Corresponding to the loss of one sector there are gains accruing to another sector and hence there are no lost opportunities in the aggregate. Under the category of transfer payments we include interest, duties and income tax. Depreciation is simply an accounting device, not even a transfer payment.

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3 Employment and redistribution consequences of this project are negligible. Nevertheless employment of unskilled labour, is treated as a benefit.

As mentioned earlier market pices do not truly reflect social scarcities, we have therefore advocated use of shadow prices. To this end various resource costs of the project have been segregated in terms of type of resource used. Following categories are specified : foreign exchange cost, domestic material cost, skilled labour cost and unskilled labour cost. One important operating cost item—natural gas, has been lumped under domestic material cost.

One may question this classification. If natural gas could be exported, it would be valued in terms of its international price. Natural gas is not an exported item under the present government's policy and nor is there any possibility of its being exported in the near future. Hence it is valued in terms of it's domestic market price.

Environmental consequences of the project are assumed to be insignificant. Hence they are not reflected in the cost schedule.

Direct benefit due to the project is in the form of output flow. They have been valued in terms of world price. This is because in the absence of the project urea would be imported from abroad. The benefit of the project is therefore the foreign exchange thus saved. In addition expenditure on housing would feature as an 'indirect benefit'. Correction would have to be made in this regard.

Cost and Benefit Streams from the Social Point of View

We are now in a position to present the time flow of costs and benefits for social profitability analysis. This is done in Table V. Note that we have treated wages of unskilled labour as an indirect benefit. This is because employment of unskilled labour is desirable. Necessary correction for housing benefit has also been made. In this respect we have assumed that investment in housing yields a perpetual return of 15% [6].[4]

Having identified the various streams of social cost and benefit our next problem is revaluation of these streams. To this end we now turn. Let us start with the social discount rate.

The Social Discount Rate (S/D/R)

Ramsey's 1928 classic article "A mathematical theory of saving" [14] has served well as a starting point in numerous discussions on optimal growth theory. One feature of Ramsey model has raised considerable controversy. Like Pigou, Ramsey was eloquent in his criticism of pure time preference as an element of S/D/R. The only reason for discounting future consumption, Ramsey argued,

[4]We have found this work of general help in preparing the present paper.

is that we will be richer in the future so that additional consumption becomes less valuable at the margin. Discounting future gains for the sake of future itself reflects, in Ramsey's words "Weakness of the imagination".

Of course, from an individual's point of view, there is nothing irrational in discounting future gains even just because they will materialise at a later date. The simplest rational is that the individual may die before he could reap the projected benefit. From the society's point of view as well one can rationalise pure time preference [15]. The reason why Ramsey and Pigou disagreed with pure time preference as a factor in the determination of S/D/R is based on more solid grounds rather than one of irrationality. They considered it unjust for the current generation to discount future gains [5]. Pure time discounting was shunned on grounds of inter-generation equity.

The formula for S/D/R used here is based on a variant of Ramsey model and, therefore, does not involve any element of pure time discount. The derivation is explained in [11].[5] Three cases have been distinguished depending upon assumptions regarding the welfare function. For our present purpose we will use the case which we consider most appealing. We assume that "Welfare depends on consumption per head". The relevant formula is given by

$$i = (1 + g - n)^{e}(1 + n) - 1$$

where 'g' is the rate of growth of consumption, 'e' is the elasticity of marginal utility of consumption with respect to consumption and 'n' is the rate of growth of population.

In this case a positive discount rate is advocated even if 'per capita' consumption is constant. The reason is, consumption is spread over more people which is taken to increase aggregate welfare.

When we come to estimation of the S/D/R, finding the magnitude of 'e' poses a problem. We have followed Fellner [7] in this regard. The range of values calculated for 'e' tend to fall beteween 1 and 2.5. Obviously choice of any single value for 'e' would be extremely arbitrary. We have therefore used various values of 'e' in calculating S/D/R. Being an index of intertemporal egalitarianism, the higher the value of 'e' the more egalitarian our approach becomes.

Due to current data limitations we have used GNP and savings data given by Alamgir and Berlage [2] in calculating 'g'.[6] The value of 'g' obtained turns out

[5] The utility function underlying this model is assumed to be both 'cardinal' (additive) as well as 'seperable'. For a c itique of Ramsey formulation see [8].

[6] Consumption is calculated as residual.

to be 4%. An upper limit of 6% on the value of 'g' is obtained on the basis of A.R. Khan's observation [9].[7]

In Table II we have calculated a number of values for 'i' on the basis of formula given above. Value of 'i' is sensitive to values of 'e' 'g' and 'n'. A value of 3% for 'n' is assumed.

TABLE II

SENSITIVITY OF 'i' to 'e', 'g' and 'n'

e \ g	II		
	4%	5%	6%
1.5	4.5	6.0	7.5
2.0	5.0	7.0	9.0
2.5	5.5	8.0	10.5

For the initial analysis we have chosen a S/D/R of 9%. Later sensitivity analysis is conducted to indicate the switching value of 'i' for the project at hand.

The Social Price of Investment

If savings rate determined by the market is optimal then at the margin a unit of consumption would be equally valuable as an unit of savings (investment). There are however, a number of reasons why market determined rate of saving is considered to be sub-optimal [15]. A necessary condition for optimality of the savings rate is equality between the opportunity cost (social marginal productivity) of capital 'R' and the S/D/R 'i'. Sub-optimality of the savings rate therefore implies that 'i' and 'R' are not equal. As a consequence of this sub-optimality of the savings rate, from the society's point of view an unit of additional savings would be considered more valuable than an unit of additional consumption. The shadow price of an unit of investment would therefore be greater than unity.

It can be shown that the shadow price of investment is given by the formula [17].[8]

$$P^* = \frac{(1-a)R}{i-aR}$$

[7]The First Five Year Plan (FFYP) of Bangladesh does not specify any target level of 'g'.

[8]It is assumed that 'a', 'i', 'R' and 'P*' remain constant over time and the dual flow of consumption and investment from a unit of reinvestment is treated as a perpetivity.

Where 'a' is the marginal rate of savings. As is clear from the formula, there is an inverse relationship between 'i' and 'P*'. As 'i' increases the value of 'P*' falls. Unfortunately no information is available about the target level of marginal rate of savings over the FFYP. Alamgir and Rahman [1] have obtained alternative estimates of marginal propensity to save. The estimated magnitudes are 11%, 14.5% and 18.1%. We have assumed a marginal savings rate of 18% and it agrees well with Khan's projection of 18.3% under the assumptions of moderate import substitution and a moderate rate of growth [9]. No attempt is made to estimate the marginal social productivity of capital. We have assumed it to be 15% which is quite conventional.

A range of values for 'P*' is obtained in Table III making different assumptions about the value of 'i'. We mentioned earlier that for the initial analysis we will use a value of 9% for 'i'. Corresponding to this assumption we obtain a value of 2 for 'P*' (Table III).

TABLE III

SENSITIVENESS OF P* TO VALUES OF i

i	0.05	0.07	0.09	0.10	0.11	0.12	0.13	0.29	0.30
P*	6.0	3.0	2.0	1.71	1.5	1.33	1.20	0.46	0.44

The Shadow Price of Labour

Ashuganj Fertilizer Factory is a highly captial intensive project and unskilled labour cost is an insignificant proportion of total project cost (both construction and operating). We therefore find it unnecessary to estimate the shadow price of labour. However, the direct social opportunity cost of unskilled labour is assumed to be zero since unemployment is rampant in Bangladesh. This may seem to make unskilled labour costless even though unskilled labour consume most of their wages and we have assumed sub-optimality of savings. This, however, is not the case. We have not assumed that shadow price of labour is zero. Direct social opportunity cost is only one element of shadow price of labour. Another element is 'indirect cost' which results from reallocation of resources from savings to consumption. This is reflected in the measurement of aggregate consumption benefit of the project. Savings are revalued in terms of consumption. Under sub-optimality of the saving rate we have a positive premium on savings so that any diversions of resources from savings to consumption is penalized.

The Shadow Price of Foreign Exchange[9]

We have now come to the most difficult part of our analysis—estimating the shadow price of foreign exchange. There is wide difference of opinion in this field which has resulted into a variety of approaches. A number of these are not operational while a number of operational ones could not be applied to the Bangladesh case due to limitations of data and other technical information.[10]

The model that we have used is the one given by E. Bacha and L. Taylor [3]. The relevant formula for the shadow price of foreign exehange is given by the expression:

$$r^* = rt^{1/1-q}$$

where $q = D(1+n_x)e_x(e_m - n_m)/(1+e_m)n_m(n_x - e_x)$

$D = P_x X / P_m M$

The various notations have the following meaning: 'r' is the official exchange rate; t' is the effect of the tariff (1 plus the tariff); 'X' is exports; M is imports; P_x and P_m are export and import prices respectively; n_x, e_x, n_m and e_m are price elasticities of export demand, export supply, import demand and import supply respectively. Bangladesh being a small country, we can assume that she faces a perfectly elastic import supply schedule. The expression for 'q' reduces to

$$\lim_{e_m \to \infty} q = D\,(1+n_x)e_x/(n_x - e_x)n_m$$

We have assumed that the official exchange rate 'r' is 15.0(U.S.$ 1.00= Taka 15.00). The value of 't' is measured as 1 plus average tariffs. The value of average tariffs is obtained on the basis of data on import value and custom receipts for the periods 1959/60 to 1969/70 [2]. The value thus obtained turns out to be 0.26 which however, is an underestimate since average tariffs is expressed as a ratio of custom duties to imports. Since the shadow price of foreign exchange is sensitive to values of 't', we will use various magnitudes of 't', regarding 1.26 as a lower limit. The value of 'D' calculated as an average of five year data (from 1965/66 to 1969/70) is found to be 0·67 [2]. Unfortunately we have no information regarding the relevant price elasticities for Bangladesh. We have therefore taken the values used by Beyer [4] in the Indian context. These magnitudes are

[9]The work of John Beyer [4] proved extremely useful for the following discussion.

[10]The Little-Mirrlees Manual [12] has the advantage of not requiring any estimation of the shadow price of foreign exchange. We however disagree with its basic hypothesis of a 'sensible' government [16].

n_x=—2.0,[11] e_x=2.3 and n_m=—2.0. The sensitiveness of 'r*' to values of 't' is now shown in Table IV.

TABLE IV

SENSITIVITY OF r* TO t

t	1.26	1.50	1.75	2.00
r*	16.07	19.13	22.31	25.5

A lower bound on the shadow price of foreign exchange can be approximated by the "force of tariff" method. The approximation is obtained by calculating import duties as a percentage of total import value for the five year period 1965/66 to 1969/70 [2]. The range obtained lies between 24% (1965/66) and 30·2% (1969/70). With r=15.0, the lower bound on r* is calculated as the range 18.6 to 19.5.

Justifying a single value for r* becomes difficult. We have therefore resorted to sensitivity analysis. For the initial situation however we have assumed r* to be Taka 22.0 (Corresponding roughly to a value of t=1.75).

Distribution of Cost and Benefit

We need to make a final correction before we can determine the net social profitability of the project. We mentioned earlier that due to savings inoptimality an additional unit of investment is more valuable than an additional unit of consumption. Since cost and benefit items are distributed amongst a number of groups, each group having different marginal propensity to save, it is important that we classify cost and benefit streams as they accrue to various beneficiaries (losers).

Four units are identified: (i) the government sector (G), (ii) the private sector (P), (iii) the corporate sector (Cr) and (iv) unskilled labour (U/S/L). The corporate sector owns the project. Items II (a-h), IV and V (a-c) in Table V, are costs accruing to the private sector. Pricing policy of the government will determine the distribution of direct benefit. The government proposes to set the ex-factory price of locally produced urea at U.S.$ 155.0 per metric ton (p.m.t). Now world price of urea (for 1978) has been estimated as U.S.$ 1700.0 c.i.f. which

[11]One would suspect that this value would be lower for Bangladesh. A lower value for n_x would merely increase both the lower and upper limits of r* specified above and would not affect the quality of our analysis.

TABLE V

EAM OF BENEFIT, COST AND CASH TRANSFER FLOWS

(Figures in million Taka)

	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
I. Direct Benefit																
a. Output Value (F.E.) (U.S. $ 155.0 p.m.t.)				255.75	920.70	1104.90	1104.90	1104.90	1104.90	1104.90	1104.90	1104.90	1104.90	1104.90	1104.90	552.45
b. Output Value (F.E.) (US$ 175.0 p.m.t.)				288.00	1039.50	1248.00	1248.00	1248.00	1248.00	1248.00	1248.00	1248.00	1248.00	1248.00	1248.00	624.00
II. Cost																
a. Construction (F.E.)	321.00	747.00	853.50	213.00												
b. Construction (domestic)	54.60	141.15	161.70	150.60												
c. Construction (U/S/L)	11.70	26.85	30.75	28.20												
d. Construction (S/L)	4.65	10.80	12.30	11.25												
e. Operating Cost (F.E.)				47.55	144.00	162.00	162.00	162.00	162.00	162.00	162.00	162.00	162.00	162.00	162.00	81.00
f. Operating Cost (domestic)				32.85	106.50	123.15	123.15	123.15	123.15	123.15	123.15	123.15	123.15	123.15	123.15	61.50
g. Operating Cost (U/S/L)				4.65	10.20	10.80	10.80	10.80	10.80	10.80	10.80	10.80	10.80	10.80	10.80	5.90
h. Operating Cost (S/L)				4.15	10.35	10.80	10.80	10.80	10.80	10.80	10.80	10.80	10.80	10.80	10.80	5.90
III. Indirect Benefit																
a. Housing (domestic)	43.95															
b. Wages (U/S/L) (domestic)	11.90	26.85	30.75	32.85	10.20	10.80	10.80	10.80	10.80	10.80	10.80	10.80	10.80	10.80	10.80	5.40
c. Non-depreciable Assets																526.50
IV. Land	6.00															
V. Transfer Payments																
a. Interest	16.50	72.00	156.00	216.90	213.45	197.40	175.95	154.65	133.35	112.05	90.60	69.30	48.00	26.70	5.40	
b. Duties	78.30	181.20	207.45	37.05												
c. Income Tax					66.15	182.85	194.55	206.25	217.95	229.80	241.50	253.20	264.90	276.60	288.45	145.65

with U.S.$ 5.0 port handling charges give an economic price of U.S.$ 175.0 (Taka 2625.00). Item Ia, therefore is the value of direct benefit going to the corporate sector. In addition corporate sector also gets IIIc as indirect benefit.

The difference between Ib and Ia is the value of benefit accruing to the private sector. No costs, however are involved.

The foreign exchange market in Bangladesh is controlled by the government. In the absence of the project urea would have been imported. The value of output at world price of urea (item Ib in Table V) times the foreign exchange premium 'h' thus accrues to the government as direct benefit.[12] The items IV and V (a-c) in Table V also obtains to the government as benefits. Similarly items IIa and IIe times 'h' are accredited to the government as costs.

Unskilled labour gains IIIb, while housing benefit goes to labour as a whole. We will assume that entire housing benefit is consumed. Hence 'labour' as a seperate category is not identified.

Net Aggregate Consumption Benefit

Net aggregate consumption benefit (NAC) due to the project will be the sum of consumption benefits of the different sectors.

$$NAC = NC^G + NC^P + NC^{Cr} + NC^{U/s/L} + HB \quad .. \quad (1)$$

Where HB means housing benefit, NC means net consumption and the superscripts refer to the sectors identified. Sectoral net consumptions are determined on the basis of the following equations:

$$NC^G = [(1 - s_g) + s_g P^*] NPV^G \quad .. \quad (a)$$
$$NC^P = [(1 - s_p) + s P^*] NPV^P \quad .. \quad (b) \quad (2)$$
$$NC^{Cr} = [(1 - s_{cr}) + s_{cr} P^*] NPV^{Cr} \quad .. \quad (c)$$
$$NC^{U/s/L} = [(1 - S_{U/s/L}) + S_{U/s/L} P^*] NPV^{U/s/L} \quad (d)$$

Where small 's' refers to marginal propensity to save and NPV to net present value. Magnitudes of s_g, s_p, s_{cr} are obtained from [1]. These are $s_g = 0.24$,[13] $s_p = 0.11$[14] and $s_{cr} = 0.58$. We have assumed unskilled labour to have a zero mps. Let us denote the bracketed terms in equations 2 (a,b,c,d) as Wg, Wp, Wcr and $W^{U/s/L}$. Value of these terms will depend besides the savings parameters, upon value of

[12] Values of r=15.0 and r=22.0 imply h=0.47.

[13] We have deviated from the convention of assuming $s_g = 1.0$ by considering the observed value of s_g for Bangladesh. The conventional assumption would substantially increase NAC under a premium on saving.

[14] s_p here refers to mps of the rural sector who benefit from fertiliser subsidy.

P* and hence also upon i. For easy reference these magnitudes are computed in Table VI. Note, that with $S_{U/S/L}=0$, $W_{U/S/L}$ is equal to 1 irrespective of the value of P*.

TABLE VI

VALUES OF W CORRESPONDING TO VALUES OF P*

P*	6.00	3.00	2.00	1.71	1.50	1.33	1.20	0.46	0.44
Wg	2.20	1.48	1.24	1.17	1.12	1.07	1.04	0.87	0.86
Wp	1.55	1.22	1.11	1.07	1.05	1.03	1.02	0.94	0.93
Wcr	3.90	2.16	1.58	1.41	1.29	1.19	1.11	0.69	0.67

NPV corresponding to the different sectors are computed in Table VII. Equations 2 (a-d) can now be used to determine NC of the various groups. These figures, expressed in milion Taka, are $NC^P=787.39$, $NC^{cr}=(—)\ 964.57$, $NC^G=4687.04$ $NC^{U/S/L}=132.63$ and HB=73.40. NAC is therefre equal to Taka 4715.89 million. This is the final result we have obtained. Social rate of return can be determined by interpolation. It turns out to be 29.5%. Contrast these results with the picture painted in private profitability analysis (Section III). Usefulness of social profitability analysis is amply demonstrated.

V. SENSITIVITY ANALYSIS

From our above discussion it is clear that it is not possible to lay down single values of the important parameters i, h and P*, with full confidence. Sensitivity analysis therefore becomes crucial. Under uncertainty, the task of the project evaluator is to specify the range of alternatives involved and leave the problem of decision making to the policy makers.

Sensitivity of NAC to values of 'i' and 'h' (and indirectly to P*) is examined in Table VIII. Being an import substituting project we would expect Ashuganj Fertilizer Project to be highly sensitive to the foreign exchange premium 'h'. This turns out to be the case as is clear from Table VIII. Varying degree of sensitivity is discernible. Responsiveness of NAC to 'h' is higher at low S/D/R. Except at sufficiently high S/D/R, we find a monotonous relationship between 'h' and NAC, at a high value of 'i', such as 0.30, NAC is positive for h=0.00,becomes negative for h=0.27 to h=0.60 and again becomes positive for h=0.68. The important point to note is that NAC remains highly positive for reasonable values of S/D/R. For such values of S/D/R, therefore, choice of value of foreign exchange (and hence h) is not very important. Only at a sufficiently high value of S/D/R

TABLE VII

DISTRIBUTION OF NET PRESENT VALUE STREAM

(Figures in million Taka)

Year	Social Discount Rate (SDR) i=0.09	Net Corporate Benefit	Net Present Value Corporate 2÷1	Net Govt. Benefit	Net Present Value Govt. 5÷1	Net Private Benefit	Net Present Value Private 6÷1	Net Benefit Unskilled Labour	Net Present Value Unskilled Labour 8÷1
1975	1.09	-536.70	-492.39	-50.07	-45.93			11.70	10.73
1976	1.19	-1179.00	-990.76	-97.89	-82.26			26.85	22.56
1977	1.30	-1421.70	-1093.62	-37.70	-29.00			30.75	23.65
1978	1.42	-490.45	-345.39	251.69	177.24	33.25	23.42	32.85	23.13
1979	1.55	370.05	238.74	644.65	415.90	118.80	76.65	10.20	6.58
1980	1.69	418.05	247.37	823.41	487.22	143.10	84.67	10.80	6.39
1981	1.84	427.65	232.42	813.66	442.20	143.10	77.77	10.80	5.87
1982	2.01	437.25	217.54	804.06	400.02	143.10	71.19	10.80	5.37
1983	2.19	446.85	204.04	794.46	362.76	143.10	65.34	10.80	4.93
1984	2.39	456.45	190.98	785.19	328.53	143.10	59.87	10.80	4.52
1985	2.61	466.05	178.56	775.26	297.03	143.10	54.83	10.80	4.14
1986	2.84	475.65	167.48	765.66	269.59	143.10	50.39	10.80	3.80
1987	3.10	485.25	156.53	756.06	243.89	143.10	46.16	10.80	3.48
1988	3.38	494.85	146.41	746.46	220.84	143.10	42.34	10.80	3.20
1989	3.68	504.45	137.08	737.01	200.27	143.10	38.89	10.80	2.93
1990	4.01	253.50	63.22	367.23	91.57	71.55	17.84	5.40	1.35
1990	4.01	526.50	131.30						
			-610.49		3779.87		709.36		132.63

TABLE VIII

SENSITIVITY OF NET AGGREGATE CONSUMPTION BENEFIT TO VALUES OF i AND h

(Figures in million Taka)

i \ h	(r*=15.00) 0.00	(r*=19.0) 0.27	(r*=20.0) 0.33	(r*=21.0) 0.40	(r*=22.0) 0.47	(r*=23.0) 0.53	(r*=24.0) 0.60	(r*=25.0) 0.68
0.50	9679.10	12425.40	13092.54	13896.75	14689.65	15197.79	15977.80	17986.97
0.07	4788.20	6292.71	6587.55	7018.59	7408.70	7720.70	8129.73	9217.56
0.09	2675.14	3988.33	4175.92	4461.30	4715.89	4918.29	4784.80	5926.23
0.10	2489.96	3315.07	3470.56	3712.40	3926.31	4095.10	4321.62	4957.35
0.11	2072.16	2768.35	2896.28	3101.97	3282.17	3423.23	3615.12	4310.81
0.12	1744.94	2334.93	2442.36	2619.11	2772.06	2890.80	3054.65	3534.18
0.13	1486.00	1989.37	2079.62	2236.97	2362.50	2462.59	2603.33	3025.23
0.30	7.17	-9.51	-22.11	-17.38	-21.64	-30.77	-29.78	37.30

does choice of 'h' becomes critical for project choice. Accordingly margin of error involved in decision making would not be very severe even if an inappropriate choice of 'h' is made.

So far as sensitivity to 'i' is concerned, net aggregate consumption benefit is a monotonically declining function of 'i' for all values of 'h'. Switching values of 'i' for the project fall in the range 0.29 to 0.31 depending upon the value of 'h'. Since these values would generally be considered as unreasonably high for discounting future gains, we can be confident that Ashuganj Fertilizer Project would be highly beneficial from the society's point of view.

VI. CONCLUDING REMARKS

In the above exercise we have been able to argue, we hope quite convincingly, the case for social profitability analysis for choice of public investment projects. We have demonstrated that commercial profitability considerations may lead us to reject a highly socially profitable investment project. This also explains why private entrepreneurs would not invest in industries such as a fertilizer producing complex without government support. One further point should also be kept in mind. Project analysis is not an exercise in isolation. It is interrelated with planning at both the sectoral as well as national level. To make this interrelationship operational the planning commission should come up with a framework where these interrelationships are properly analysed so that the project evaluator knows what values to uphold and which parameters (those concerning national level) to use.

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Appendix

TABLE I

CAPITAL COST ESTIMATE

Items	(in million US $)			(in million Taka, US $ 1.00 = Tk. 15.00)		
	Foreign	Local	Total	Foreign	Local	Total
1. Land Acquisition		0.4	0.4		6.0	6.0
2. Site Preparation	10.5	2.4	12.9	157.5	36.0	193.5
3. Battery Limits Equipment and Material (fob)	42.5		42.5	637.5		637.5
4. Auxiliary and Service Units including Spare Parts	9.7		9.7	145.5		145.5
5. Material Handling Equipments including Spare Parts	5.7		5.7	85.5		85.5
6. Construction Equipment	6.1		6.1	91.5		91.5
7. Miscellaneous Equipment	1.4		1.4	21.0		21.0
8. Building Structures	8.6	5.4	14.0	129.0	81.0	210.0
9. Freight, Insurance and Duty	7.5	36.5	44.0	112.5	547.5	660.0
10. Construction & Erection	2.2	9.4	11.6	33.0	141.0	174.0
11. Services	25.3	0.7	26.0	379.5	10.5	390.0
12. Management Assistance	6.0	1.3	7.3	90.0	19.5	109.5
13. Pre-operation Expenses	2.1	4.6	6.7	31.5	69.0	100.5
14. Physical Contingency	12.8	8.3	12.1	192.0	124.0	316.5
15. Working Capital	1.9	10.9	12.8	28.5	163.5	192.0
16. Interest during Construction		27.2	27.2		408.0	408.0
Total	**142.3**	**107.1**	**249.4**	**2134.5**	**1606.5**	**3741.0**

Cost figures are in 1974 prices inclusive of escalation.

TABLE II

CAPITAL COST DISTRIBUTION (YEAR-WISE)

Items	(in ml. U.S. $)					(in ml. Taka, U.S. $ 1.00 = Tk. 15.00)				
	Year 1 (1975)	Year 2 (1976)	Year 3 (1977)	Year 4 (1978)	Total	Year 1 (1975)	Year 2 (1976)	Year 3 (1977)	Year 4 (1978)	Total
A: **Foreign Exchange Component**										
i) Capital Cost Items	21.4	49.8	59.9	10.0	138.1	321.0	747.0	853.5	150.0	2071.5
ii) Additional Working Capital				1.9	1.9				28.5	28.5
iii) Pre-operating Expenses				2.3	2.3				34.5	34.5
Sub-Total-A	**21.4**	**49.8**	**59.9**	**14.2**	**142.3**	**321.0**	**747.0**	**853.5**	**213.0**	**2134.5**
B: **Local Currency Component**										
i) Duties	5.7	13.2	15.1	2.7	36.7	85.5	198.0	226.5	40.5	550.5
ii) Interest during Construction	1.1	4.8	10.4	10.9	27.2	16.5	72.0	156.0	163.5	408.0
iii) Additional Working Capital			10.9	10.9					163.5	163.5
iv) Others	5.0	11.6	13.3	2.4	32.3	75.0	174.0	199.5	36.0	484.5
Sub-Total-B	**11.8**	**29.6**	**38.8**	**26.9**	**107.1**	**177.0**	**444.0**	**582.0**	**403.5**	**1606.5**
Total : A+B	**33.2**	**79.4**	**95.7**	**41.1**	**249.4**	**498.0**	**1191.0**	**1435.5**	**616.5**	**3741.0**

TABLE III

INCOME STATEMENT AFCC : COMMERCIAL PROFITABILITY ANALYSIS

(U.S. $ 1.00=Tk. 15.00) (Value figures in million Taka)

	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Utilisation %	50	75	90	90	90	90	90	90	90	90	90	90	90
Urea Output (tons)	110,000	396,000	475,200	475,200	475,200	475,200	475,200	475,200	475,200	475,200	475,200	475,200	237,600
Inventory Adjustment	43,200												
Units Sold	66,800	396,000	475,200	475,200	475,200	475,200	475,200	475,200	475,200	475,200	475,200	475,200	237,600
Unit Price (Tk.)	2325.00	2325.00	2325.00	2325.00	2325.00	2325.00	2325.00	2325.00	2325.00	2325.00	2325.00	2325.00	2325.00
Sales (Tk. ml.)	155.25	920.70	1104.90	1104.90	1104.90	1104.90	1104.90	1104.90	1104.90	1104.90	1104.90	1104.90	552.45
Production Costs													
Variable	48.00	172.50	207.00	207.00	207.00	207.00	207.00	207.00	207.00	207.00	207.00	207.00	103.50
Semi-Variable	1.05	1.05	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	1.05
Fixed Costs*	152.40	366.00	366.00	366.00	366.00	366.00	366.00	366.00	366.00	366.00	366.00	366.00	183.00
Total Production Cost	201.45	539.55	575.10	575.10	575.10	575.10	575.10	575.10	575.10	575.10	575.10	575.10	287.55
Inventory Adjustment	52.35												
Cost of Sales	149.10	539.55	575.10	575.10	575.10	575.10	575.10	575.10	575.10	575.10	575.10	575.10	287.55
Operating Profit	6.15	381.15	529.65	529.65	529.65	529.65	529.65	529.65	529.65	529.65	529.65	529.65	264.90
Other Charges													
Interest on Lt. Debt	53.40	213.45	197.40	175.95	154.65	133.35	112.05	90.60	69.30	48.00	26.70	5.40	
Profit before Tax	-47.25	167.70	332.70	353.40	375.00	396.30	417.75	439.05	460.35	481.65	502.95	524.25	264.90
Income Tax (55%)		66.15	182.85	199.55	206.25	217.95	229.80	241.50	253.20	264.90	276.60	288.45	145.65
Net Profit	47.25	101.40	149.55	159.15	168.75	178.35	187.95	197.55	207.15	216.75	226.35	235.95	119.25
Depreciation	111.90	268.50	268.50	268.50	268.50	268.50	268.50	268.50	268.50	268.50	268.50	268.50	134.25

*Fixed cost includes depreciation.

For calculating I/R/R we have added back depreciation and interest payments to 'Net Profit' figure.

Note

Reduction in Rural Income Inequality through Land Redistribution : A Quantitative Estimate*

by

IFTIKHAR AHMED**

It has often been emphasised that in the developing countries a small-farm-based rural development strategy is necessary not only for reducing rural income inequalities but also for achieving better productive efficiency. This conclusion is equ ılly valid in situations where some technical change in agriculture has occurred.[1] This has been interpreted by some to mean straight forward redistribution of land. However from a policy point of view, it is extremely important to have some prior knowledge of the likely quantitative relationship between the distributions of land-ownership and rural household incomes.

Therefore,in this paper an attempt is made to provide a quantitative estimate of this relationship for the developing countries.

Two forms of regression equations were fitted between the Gini coefficients for the distribution of land-ownership and the distribution of rural household income based on international cross-section data from 25 developing countries

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1For a fairly comprehensive set of evidence from a wide range of developing countries, see Iftikhar Ahmed, "Technological Change in Agriculture and Employment in Developing Countries", paper to be presented at the General Conference of the International Union for the Scientific Study of Population due to be held in Mexico, August 1977.

covering all three continents of Asia, Africa and Latin America (see table). The linear and log linear relationships lead us to draw the following conclusions.[2]

(1) Gini Rural Income $= .31 + .25$ (Gini Land-ownership) $R^2 = .28$
$(.057)\ (.082)$

(2) Log (Gini Rural Income) $= -.27 + .30$ log (Gini Land-ownership) $R^2 = .31$
$(.024)\ (.095)$

A significant positive relationship exists between the Gini coefficients of the two distributions. The magnitude of the value of the two regression coefficients (.25 in equation 1 and .30 in equation 2) are interestingly small. Further, land-ownership distribution explains a meagre 30%of the variation in the distribution of rural household incomes.

These results although derived from this simple exposition, have important and valuable policy implications. Land reform alone can reduce only partially the inequality of rural income distribution. This only reinforces the apprehensions expressed by some that without accompanying changes in other agrarian structures, institutions and policies, land reform alone will not lead to a major reduction in income inequality. A situation of this kind is best exemplified by the destruction of the large land-owner-cum-money-lender class following land redistribution without providing alternative financial institutions to the small farmers for obtaining their working capital.

A remark on the data used to arrive at the Gini Coefficients utilised in these regressions needs to be made. (a) The rural household incomes do not ordinarily include the incomes of absentee landlords resident in cities. Their inclusion may result in a higher value of the regression coefficient for the land-ownership distribution Gini Coefficient in the regressions: (b) the data on the Gini Coefficient for land-ownership distribution does not include the landless, the inclusion of whom may again result in a higher value of the regression coefficient of the land-ownership distribution Gini Coefficient in the equations; (c) the independent variable probably contains distributions for operational holdings, at least in some countries; (d) the dependent variable contains all rural households (including non-agricultural) and all sources of income and, (e) cross-section comparison entails other problems: to test this hypothesis, countries have to be similar, i.e., similar land-man ratio, similar factor share of land etc. Use of regional dummies could have helped overcome this problem. In any event the fact

[2]All coefficients are significant at the 1% level. The standard errors for each coefficient are in parentheses.

TABLE I

AVERAGE FARM SIZE, LAND OWNERSHIP CONCENTRATION AND LAND ENDOWMENT IN 30 SELECTED DEVELOPING COUNTRIES, BY REGIONS[a]

Region	Average Farm Size 1960 (hectares)	Gini Coefficient for Farmland Distribution 1960	Gini Coefficient for Rural Household Income Distribution[b] early 1960s	Land Area per Agricultural Population 1970 (hectares)
Asia				
Japan	1.18	.411	.41	1.73
Indonesia	1.20	.553		2.18
Taiwan	1.27	.401	.43	0.57
Sri Lanka	1.61	.665	.35	1.00
Korea	2.06	.195	.31	0.57
Pakistan	2.35	.631	.33	1.84
India	2.70	.584	.48	0.90
Philippines	3.59	.507	.42	1.13
Thailand	3.47	.455	.44	1.86
Turkey	5.03	.629	.56	3.18
Africa				
U.S.A.	1.59	.598	.43	0.19
Uganda	3.29	.485	.34	2.63
Senegal	3.63	.399	.58	6.48
Morocco	9.82	.640		4.74
Kenya	11.74	.822	.64	3.40
Tunisia	15.40	.645	.50	6.65
Latin America				
Dominican Rep.	5.05	.798	.45	1.85
Guatemala	8.34	.828	.30	3.48
Panama	18.81	.737	.55	11.97
Peru	20.37	.935	.59	20.97
Colombia	22.59	.868	.58	11.80
Nicaragua	37.41	.801		11.51
Costa Rica	41.05	.782	.46	6.32
Brazil	74.86	.831	.59	20.95
Venezuela	81.21	.927	.45	32.31
Paraguay	108.53	.938		32.03
Chile	118.32	.933	.51	30.47
Mexico	123.87	.747	.58	8.56
Uruguay	195.26	.820	.43	36.83
Argentina	371.06	.836	.51	75.11

Sources :

(a) R. Albert Berry and William R. Cline, *Farm Size, Factor Productivity and Technical Change in Developing Countries*, ILO/IBRD, January 1976 (Roneo), P. 43.

(b) Salil Jain, *Size Distribution of Income : Compilation of Data*, IBRD, Bank Staff Working Paper No. 190, Washington D.C., November 1974. In a few cases national data were used where rural data were not available.

that land-ownership distribution here can explain 30% of the variation in rural income distribution is remarkable.

We have observed from the quantitative analysis that land reform alone can reduce only partially the inequality in rural household income distribution. Only about 30% of the variation in rural income distribution is explained by the distribution of land-ownership.

This only confirms the fears expressed by some that in order to bring about a greater equality in distribution of rural incomes, other types of agrarian reforms will have to accompany land reform.

Book Reviews

The Journal of the Institute of Bangladesh Studies, Vol. 1 No. 1, 1976; Published by the Director, Institute of Bangladesh Studies, University of Rajshahi, July 1976, (pp. 190 ; Tk.45.00).

This is a new journal published by the Institute of Bangladesh Studies, Rajshahi University. This volume contains eleven articles on topics of socio-economic and political interest to Bangladesh.

Some of the articles are very well written but some tend to be wanting in clarity of purpose. Some others can be questioned regarding even their usefulness ; for example, the Maps of Bangladesh or the last article on hospitals. Here I shall review some of the more interesting articles and ignore the rest.

The first article on the National Language Issue by S.A. Akanda is one of the superior articles in the volume. It analyses the interlink among the factors which initiated and carried forward the language issue. Although officially the issue had been settled by 1954, the past events had already created mutual distrust between East and West Pakistanis. Bengali nationalism had already taken root and subsequent events only went to further consolidate the nationalism. The article analyses not only the results of the events but also seeks out the motives behind the events furnishing very plausible explanations for them. Within the twenty eight brief pages devoted to the article, it is as scholarly as one could expect. To one, who is not conversant with the issue, this article provides a good understanding of the whole matter. On the other hand, to one who is already reasonably conversant, it provides a neat "cause and effect" picture.

The article on the Chittagong Port by M.K.U. Molla is also an interesting one. It is a brief history of the development of the port, particularly during the period 1905-12 when Bengal had a partitioned status. The conflict of interest between those in favour of Calcutta port and those in favour of Chittagong port (which in fact represents the contradiction between supporters and non-supporters of the partition of Bengal) is very clearly analysed. This and some hard-to-find data make the article eminently useful to the interested reader.

The third article, "The Portrait of a Community" by Saifuddin Joarder, is a review of a Ph. D. dissertation—turned book, the *Muslim Community in Bengal, 1884-1912* by Sufia Ahmed. Joarder evaluates the book to be generally valuable. He however, criticizes the book on the ground of limited coverage around the main theme. This criticism will appear somewhat unfair if one accepts the fact that it is the prerogative of an author to decide the scope of his/her book.

However, Joardar deserves congratulation for presenting a lucid critic of an otherwise interesting book.

Jute Cultivation in Bengal by Wazed Ali is the fourth article. It is of more limited interest than the first three. Much of the article is unrelated to the purpose of the study as implied in its title. The study is not an empirically sound one. The author has failed to establish any clear hypothesis. He has not presented enough empirical evidence in support of his contention that jute did not expand at the cost of rice but at the cost of indigo.

Of the remaining articles only two are of any reasonable quality to merit mention. These are, the one on Titumir's Agrarian Uprising by Shamsun Nahar and the other on the Hindu-Muslim relations by Ghulam Murshid.

The article on Titumir does give a good analysis of the causes of the movement; why it started, spread and again ended unsuccessfully. The main purpose of the article is to show that the cause of the uprising was economic and not religious, as claimed by some. The author has done a reasonable job within the limits of the short space allotted to it.

The other article on the Hindu-Muslim relations again sees the basic reasons of communal clashes as economic in origin. What it wants to establish is that clashes occurred because of contradictions in economic interests. But historical and political circumstances happened to work out to ensure that the groups lying on different sides of the line of economic contradiction also happened to belong to different religion. So the clashes that occurred due purely to economic reasons were often wrongly and motivatedly, coloured as one of religious nature.

Apart from the contents, the volume as it is, deserves a hearty welcome on the Bangladesh scene. It will fill up a significant gap as there is no journal of this nature covering such a wide range of subjects. The get-up of the journal is of reasonably high standard. One could perhaps improve the print on the cover page to make it look more impressive. The print on the inside pages is of very good quality, but are infested with printing mistakes. At some places they become very irritating. Part of the fault belongs to proof-reading. The language and style of presentation of some of the articles are quite below that expected of such a journal. However, all of these can be improved and with better editing and more serious research improved quality output will be easy to provide. At this stage one should congratulate the staff members of the Institute of Bangladesh Studies, University of Rajshahi, on their noble effort and hope that the journal will continue to be a permanent feature in the academic life of Bangladesh so as to enlighten all concerned on the history, culture, tradition, society and economy of the country.

Bangladesh Institute of Development Studies, QUAZI M.A. MALEK
Dacca.

The Future for Hard Fiber and Competition from Synthetics, by Enzo R. Grilli; World Bank Staff Occasional Papers, Number Nineteen, 1975; Distributed by Johns Hopkins University Press, Baltimore and London (pp.xii+108).

Starting with a "foreward" by the World Bank president Mr. Robert McNamara, this volume has six sections and three annexures. The purpose is to analyse the world hard fiber economy and reach policy conclusions advantageous from the point of view of the producing countries.

By and large, hard fibers mean sisal, henequen and abaca (Manila hemp). Only Brazil, Tanzania, the Philippines and Mexico account for about 65% of the world production, of whose exports 80% are absorbed by the developed countries. Tanzania and Haiti are the only countries which earn a substantial proportion (not specified) of their total foreign exchange from hard fiber exports.

Chronic oversupply (due to the lack of alternative uses of the land producing hard fibers) and competition from synthetics are the reasons for the depressing tendency in prices. To assuage this tendency an informal agreement between the exporters and importers, fixing quotas and floor prices, was put into operation from January 1968. The performance of the agreement has swayed between success and failure from then upto 1972, the period apparently covered by the study. It is feared that the future of the industry is dark. The long run solution is seen as a production (acreage) cut. To that end the World Bank can assist the diversification efforts of the hard fiber producing farmers. Further, to improve the absolute demand for the hard fibers the Bank can help in the research efforts to evolve new end uses for these fibres.

The volume as a whole is obviously of limited interest. In terms of acreage, quantum of production, trade etc., the hard fibers industry is very small in global terms. But the two countries for which it is important, will hopefully benefit from this study in terms of a clear presentation of the issues involved, the nature of the problem and the possible solutions. However, by no means can the study be considered to be adequate to answer all the questions. The analysis has not been everywhere very deep.

Bangladesh Institute of Development Studies, Dacca. QUAZI M.A. MALEK

Rural Cooperatives as Agents of Change : A Research Report and a Debate ; United Nations Research Institute for Social Development, Geneva, 1975, (pp. xii+116).

This is the eighth and final volume in the series studying the rural cooperatives as agents of change. Forty grass-root cooperatives in thirteen countries of Asia,

Africa and Latin America have been included in the study. In spite of this, the study acknowledges that the results cannot be considered to be representative of all cooperatives. However, the closest to a general conclusion is the following—"rural cooperatives in developing areas today bring little benefit to the masses of the poorer inhabitants of those areas and cannot be generally regarded as agents of change and development for such groups. It is the better off rural inhabitants who take advantage of the cooperative services and facilities such as government supported credit and technical assistance channelled through cooperatives" (p.ix). Often the poorer inhabitants in effect remain excluded from even the membership of the cooperatives. Where the membership is wider, the existing structure of the community tends to be reporduced in the cooperatives. In short, the existing kinds of cooperatives appear, by and large, to be poor agents of change and so this study implies the need for a serious review of cooperative policy.

In the Asian part of the study three grass-root cooperatives were included from the Comilla area of Bangladesh. Regarding these the opinion of the (study) project personnel themselves was that "Comilla should have been left out since it was very exceptional and the success depended to an unusual extent on one person's leadership" (pp.42-43).

The volume as a whole, however, fails to give any consolidated opinion at all. The range (geographical) of coverage is far too wide to allow this. Prior to this volume seven other volumes, dealing with the role of cooperatives as agents of change, have been published, each more or less dealing with one case study. In this volume there is an attempt to give an overview of all these case studies. But since there are very few results common to all the case studies, an overview does not really exist. If one were to attempt to understand the global role of co-operatives as agents of change, one would discover that no such role is there. One can at best proceed case by case for which one would need to fall back on one or more of the seven earlier volumes. Hence in short, this volume is only a marginal addition to the series of studies.

Bangladesh Institute of Development Studies, Dacca. QUAZI M.A. MALEK

Internal Migration in Developing Countries, by Michael P. Todaro. Published by International Labour Organisation under World Employment Programme (A paper back of 106 pages. Price : 20 Swiss Francs).

Internal Migration in Developing Countries is a survey study conducted by Michael P. Todaro. The book is presented in seven chapters and includes an introduction, three appendices and a bibliography. Chapter one provides a general

introduction to the problem. In Chapter two the author makes a brief discussion of Ravenstein's "laws" of migration and E. S. Lee's theory of migration. The Chapter is closed with a critique of Lee's theory. Chapters three and four present meat to bite upon, while the remaining three chapters sum up the discussion.

One of the basic theme of the book is to cast doubt on the two sector Lewis/Ranis/Fei development model of an under-developed labor surplus economy. Todaro has convincingly argued that the notion of rural internal mirgration as an engine of growth in the urban sector has lost ground to the contrary view that rapid internal migration from rural to urban areas is "the major contributing factor to the ubiquitous phenomenon of urban surplus labor and as a force which continues to exacerbate already serious urban unemployment problems caused by growing economic and structural imbalances between urban and rural areas" (p.2).

A second aspect of the study is the review of the various models of internal migration analysis. This is the subject matter of Chapter 3. The author lays stress on the point that although work of geographers, demographers and sociologists have dominated in the field of internal migration, economic factors are more important in explaining the migration process. In this light Todaro has advocated an economic theory of internal migration. The Nuemann - Morgenstern postulate of expected utility maximisation is the starting point. Todaro model is, however, couched in terms of 'expected earnings' maximisation rather than expected utility. "The fundamental premise is that migrants as decision-makers consider the various labor market, say, the rural and the urban sectors, and choose the one which maximises their "expected" gains from migration " (p.28). Various extensions, notably those by Harris - Todaro and Fields, of the basic Todaro hypothesis of 'expected income maximisation are considered. More importantly, the author confidently concludes that "the idea that migration proceeds primarily in response to differences in "expected" urban and rural real incomes and that as a result of this the observed accelerated rates of internal migration in developing countries in the context of rising urban unemployment are not only a plausible phenomenon but are in fact entirely rational from the private "expected" income maximisation view point of individual migrants—remains widely accepted to this day as the "received theory" in the literature on migration and economic development" (p.45).

There are a number of problems with the expectation hypothesis. For one thing, an individual migrant may not be expected utility or expected income maximiser (always prefers certain prospects). Having a job or not having one may well make the difference between life and death for many. In this situation it would be perfectly rational for an individual to prefer staying with his rural occupation

despite the fact that an urban job is much more prospective (expected earnings higher in the urban area), given that probability of obtaining that urban job is less than one. Yet another problem is, translation of expected utility maximisation in terms of expected income maximisation requires rather restrictive assumptions. And of course, empirical evidence presented in favour of this hypothesis is rather scanty.

Chapter 4 explores the econometric aspects of migration models. The chief contribution in this respect is to identify the variables which may be considered relevant for econometric studies on migration and consider their relative importance. Distinction is made between "micro" and "macro" types of migration functions in the context of parameter estimation. Further, use of survey approach, compared to census approach, is advocated and an attempt is made to solve the problem of measuring variables of migration functions. Some comments are added on estimation techniques correctly pointing out the defects of ordinary least square estimation process.

Chapter 5 reviews the various quantitative migration studies. These, the author notes, unambiguously bring out the importance of economic factors in explaining migration. One important economic factor—differences in average income in two places under comparison, is singled out as the most important explanatory variable. Some other interesting results are, a positive correlation between education and migration, negative effect of distance on migration and positive correlation between migration rates and urban contacts in the form of friends and relatives.

Chapter 6 identifies the further areas of research while Chapter 7 provides a brief conclusion.

Although the book does not add much to the existing body of knowledge in this field it has made contribution in a different way. Being a review of the existing literature, it has successfully integrated the dispersed aspects of the problem in a fairly comprehensive treatment. Research workers and other serious readers would welcome the extensive bibliography provided at the end of the discussion.

Bangladesh Institute of Development Studies, Dacca. SADIQ AHMED

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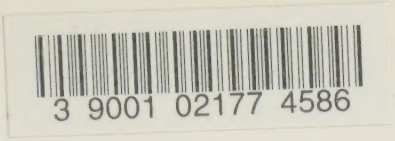
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